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Flanged Bombardier Beetles of Nepal (Insecta: Coleoptera: Carabidae: Paussinae), with nomenclatural and taxonomic notes and descriptions of new species

PETER NAGEL

Abstract

An annotated list of Paussinae reported from Nepal is given, representing the first detailed overview of the country fauna. Most species are illustrated. Three new species of Paussini are introduced to science: *Protopaussus vignai* **sp. nov.**, *Melanospilus chitwanensis* **sp. nov.** and *Paussus* (*Paussus*) *yubaki* **sp. nov.** Taxonomic and nomenclatural notes comprise one new and one re-evaluated synonymy and the taxonomic assessment of the range of morphological variation in some species. New data on the general distribution of the listed species are also given. The 16 species currently known from Nepal represent only a small fragment of the Paussinae which probably live in this country. All Nepalese Paussinae are Indomalayan faunal elements, which corresponds with the predominantly pantropical distribution of the taxon. *Paussus tibialis* represents the sister species of the exclusively Palaearctic species *Paussus turcicus*.

Zusammenfassung

Der Beitrag enthält eine kommentierte Zusammenstellung der Paussinae von Nepal. Dies ist die erste detaillierte Übersicht der Paussinenfauna dieses Landes. Es werden drei neue Arten der Paussini beschrieben: *Protopaussus vignai* **sp. nov.**, *Melanospilus chitwanensis* **sp. nov.** und *Paussus* (*Paussus*) *yubaki* **sp. nov.** Die taxonomischen und nomenklatorischen Beiträge beinhalten eine neue Synonymie und die Neubewertung einer etablierten Synonymie sowie die Analyse der taxonomischen Relevanz des Spektrums morphologischer Variation bei einigen Arten. Neue Fundortdaten erweitern die bekannte Gesamtverbreitung. Die derzeit 16 aus Nepal bekannten Arten stellen lediglich einen kleineren Teil der vermutlich vorkommenden Arten dar. Alle bisher aus Nepal nachgewiesenen Arten sind indomalayische Faunenelemente, was der pantropischen Verbreitung des Taxons Paussinae entspricht. Die Art *Paussus tibialis* ist die Schwesterart der ausschließlich paläarktischen Art *Paussus turcicus*.

Key words: Coleoptera, Carabidae, Paussinae, Himalaya, Nepal, new species, new records, taxonomic notes, nomenclatural notes

Introduction

Paussinae comprise taxa with absent or occasional relations with ants such as the Ozaenini, and demonstrably myrmecophilous taxa such as the Protopaussini and Paussini (GEISELHARDT et al. 2007). Conspicuous traits are often used for the vernacular name of a taxon. Wasmann's German term "Fühlerkäfer" points to the often bizarre shape of the antennae of the Paussini (WASMANN 1897). The term "ant nest beetles" was introduced by SKAIFE (1954) originally for the African Paussini which are obligate myrmecophiles. Like most common names this term is also not exclusive, because there are many other myrmecophiles among other beetle taxa. Recently, the vernacular name "False bombardier beetles" was introduced for the Paussinae (ERWIN et al. 2015). However, this name seems to be an established name for some Carabidae-Galeritini (TABER & FLEENOR 2005). The term "Flanged Bombardier Beetles" was introduced by MOORE (2006). It underscores the ability of explosive expulsion of chinones, a character of the defence chemistry shared only with Brachininae. The sub-apical elytral "flange of Coanda" is unique to all Paussinae except Metriini (which also differ in expelling their defensive fluid in a non-explosive manner).

At the beginning of the 19th century, when the first two species were described from Nepal, the taxon was treated at family level "Paussidae" as part of Xylophaga and did not yet comprise the carabid-like Ozaenini. Whilst its identity as part of Adephaga was already recognized by BURMEISTER (1841) it is only since 1950 that the Paussini are regularly treated as part of the "Ozaenine complex" together with Ozaenini and Protopaussini within Carabidae (DARLINGTON 1950). The current higher

classification (DI GIULIO et al. 2003, LORENZ 2005b, MOORE 2006, GEISELHARDT et al. 2007, BOUCHARD et al. 2011) has been influenced by application of principles of "phylogenetic systematics" (NAGEL 1987), by larval traits (DI GIULIO 1999) and by combined morphological and molecular studies (MOORE 2006, 2008, MOORE & ROBERTSON 2014, ROBERTSON & MOORE 2016).

LUNA DE CARVALHO's (1989) monograph of Protopaussini and Paussini as well as the carabid catalogues of LORENZ (1998a,b, 2005a,b) represent considerable achievements of their time. The splitting into distinct genera or subgeneric subdivision of *Paussus* Linnaeus, 1775, however, was based on similarity rather than relationship until ROBERTSON & MOORE (2016) presented a new classification based on molecular as well as morphological criteria. A summary of the present nomenclatural status is provided by NAGEL et al. (2017a,b).

The first Paussinae reported and at the same time described from Nepal are *Paussus hardwickii* Hope, 1831 and *Platyrhopalus acutidens* Westwood, 1833. This state of knowledge (reporting either or both from Nepal) remained unchanged through all standard catalogues or monographs on Protopaussini and Paussini such as GEMMINGER & HAROLD (1868), RAFFRAY (1886), ATKINSON (1891), GESTRO (1910), FOWLER (1912), JANSSENS (1953), and LUNA DE CARVALHO (1989), as well as CSIKI (1927) or ANDREWES (1929, 1930) who did not report Ozaenini from Nepal. The first reports on Paussinae with concrete localities from Nepal were published by LASSALLE (1982) and JANETSCHKE (1990), i.e. more than 150 years after the initial records for the country.¹

1) *Paussus hardwickii* and two additional species of unknown identity from Nepal ("*Paussus punctatus*" = nomen nudum, and "one other species") were registered in 1835 by the British Museum as part of the bequest of Major General Thomas Hardwicke (1756-1835) (Anonymous 1839, p. 399) (cf. type localities of *Platyrhopalus acutidens* and *Paussus hardwickii* below)

One country list of Nepalese insects does not report any paussine beetle (THAPA 2000), while JOSHI & MANANDHAR (2001) report one *Platyrhopalus* species. CHAUDHARY's (2005) list of Nepalese Carabidae enumerates seven species of Ozaenini, Paussini and Protopaussini yet all but one without locality. THAPA (2015) lists four nominal taxa (= three valid species) with localities. Nepal is considered a separate country record in the Catalogue of Palaearctic Coleoptera (LÖBL & SMETANA 2003, LÖBL & LÖBL 2017). In the first edition, eight species were reported from Nepal (NAGEL 2003b, 2004) and the recently published second edition lists twelve species (NAGEL et al. 2017b). A few other publications with detailed locality data are used for the following survey of Nepalese Paussinae.

The aim of the present contribution is to provide the first summing up of what is faunistically known about the Paussinae from Nepal. It is intended to serve as a basis for future studies on the diversity, ecology and distribution of this taxon. Some new nomenclatural and taxonomic notes are given for the treated taxa, in particular with regard to subgenus assignment in *Paussus* Linnaeus.

Material and Methods

Taxonomic and nomenclatural data: The entries of genus and species names contain the following data together with the reference to the first description:

The earliest day and month of documented existence of the publication is inserted in square brackets following the year of publication. The source of evidence for this date is attached in square brackets to the literature record in the reference chapter. The page number following the colon behind the date of publication represents the first mention of a name as part of its description, followed in brackets by a sequence or range of page numbers and illustrations which altogether make up the full description.

The type locality is listed first in its originally published version (with quotation marks). This record is followed by an amended version, mostly drawn from further data available in the publication itself or in additional publications (cf. ICZN 1999: §76A). Information on synonyms of genus group taxa were recently published (NAGEL et al. 2017b) and do not generally need to be repeated here. The present paper lists only the new nomenclatural and taxonomically relevant acts.

The chapter "References" at the end of this contribution lists all authors cited and formatted in the text as small capitals. We also cite in full the references of species descriptions whenever definite page numbers are given.

References for identification: The "Identification" paragraphs provide a selection of the more comprehensive tools and subsequent additions, especially for entomologists not intimately familiar with Paussinae.

Figures: All illustrations show the appendages of the right side at their broadest view while the left antenna and legs are shown at their narrowest view, i.e. at a distortion of 90 degrees. The scale bar represents 1 mm.

Standardized body length: In dorsal view, the frontal margin of head to the hind margin of the elytra.

Microscope: The specimens were examined using a Leica M205C stereomicroscope, with 10x eyepieces and Planapo

1.0x and 1.6x front lenses, allowing magnification up to 240 times. An eyepiece micrometer was used for measurements.

Distribution data: The distribution data consist of published and unpublished records. References are given for the Nepalese localities. We prefer the term "Indomalayan Region" to "Oriental Region" for the reasons discussed by CLARK et al. (1988). Subdivisions are either Subregions according to CORBET & HILL (1992) or descriptive terms (i.e. not standardized), unless otherwise stated.

Provenance of presented data: The compilation of the species known to occur in Nepal is based on the following sources. I checked the published data, primarily from my own databank. I checked my notes on material sent to me for identification and the label data of specimens which I identified during my visits to several scientific collections. However, the lack of mention of Nepal specimen data from collections of a natural history museum does not necessarily mean that no such data exist at that institution. Normally, my visits focused on particular groups of taxa and not necessarily on the Asian fauna of Paussinae. The stored and incoming material at NMB, however, was regularly screened. The "Material examined" paragraphs are a compilation of all hitherto unpublished locality data of species now known to occur in Nepal, unless otherwise noted.

Determination of subgenus assignment in *Paussus*: The new species, as well as *Paussus* species recorded for Nepal are assigned to a subgenus according to ROBERTSON & MOORE (2016). The dissection of mouthparts was necessary.

Acronyms of repositories of type specimens and material examined (cf. EVENHUIS 2007):

ADGC	Andrea di Giulio Collection, Università degli Studi Roma Tre, Rome, Italy
BGUB	Coll. P. Nagel in Biogeographische Sammlung, Universität Basel, Basel, Switzerland
Coll. Pankow	Coll. Wolfgang Pankow, Dogern, Germany
Coll. Wrase	Coll. David W. Wrase, Berlin, Germany
CMNH	Carnegie Museum of Natural History, Pittsburgh, U.S.A.
HNHM	Hungarian Natural History Museum, Budapest, Hungary
IRSNB	Institut royal des Sciences naturelles de Belgique, Brussels, Belgium
IZCAS	Institute of Zoology, Chinese Academy of Sciences, Beijing, China
MHNG	Muséum d'Histoire Naturelle, Geneva, Switzerland
MTD	Museum für Tierkunde, Dresden, Germany
NHM	Natural History Museum, London, UK
NHMK	Natural History Museum (Tribhuvan University), Swayambhu, Kathmandu, Nepal
NHMM	Natuurhistorisch Museum Maastricht, Netherlands
NMB	(former NHMB), Naturhistorisches Museum Basel, Switzerland
NMB(Frey)	Sammlung Georg Frey in NMB
NME	Naturkundemuseum Erfurt, Germany
NMPC	National Museum, Natural History Museum, Prague, Czech Republic
NMW	Naturhistorisches Museum Wien, Vienna, Austria
OUMNH	Oxford University Museum of Natural History, Hope Entomological Collections, Oxford, UK

RMNH	Naturalis Biodiversity Center (formerly Rijsmuseum voor Natuurlijke Historie), Leiden, Netherlands
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany
TMP	National Museum of Natural History (Transvaal Museum), Pretoria, South Africa
ZFMK	Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany
ZMHUB	Zoologisches Museum, Humboldt Universität, Berlin, Germany
ZMUC	Natural History Museum of Denmark, University of Copenhagen, Zoological Museum, Copenhagen, Denmark
ZSM	Zoologische Staatssammlung, Munich, Germany

Taxonomy

The arrangement of taxa is from the more basal to the supposedly more derivative lineages (NAGEL 1987, MOORE 2006, GEISELHARDT et al. 2007, cf. DARLINGTON 1950, LORENZ 2005b, BOUCHARD et al. 2011, ROBERTSON & MOORE 2016). Nomenclature follows NAGEL et al. (2017b), whenever applicable.

Paussinae Latreille, 1806 (Flanged Bombardier Beetles)

Ozaenini Hope, 1838

***Eustra* Schmidt-Göbel, 1846**

Eustra Schmidt-Göbel, 1846 [30 June]: 65

Type species: *Eustra plagiata* Schmidt-Göbel, 1846 [30 June]: 66 (66, plate III, fig.1) (by original monotypy)

Included species: Twenty-four species reviewed by DEUVE (2001), with three additional species described by DEUVE (2002, 2005) and SONG et al. (2018).

Relationship with ants: *Eustra* and *Dhanya* have morphological characters which are found in myrmecophilous beetles (such as apertures in the outer tegument or crassate antennae in adults and characteristic adaptations in larvae). A relationship with a single ant species is documented, suggesting a facultative association: *Eustra* spp. were reported from nests of *Pachycondyla javana* (Mayr, 1867) (Ponerinae, Ponerini) from Taiwan (larval stage) (MOORE et al. 2011), Shanghai (adults) (SONG et al. 2018) and from southern Japanese islands, where adults were observed feeding on dead insects in the nest of the same ant species (MARUYAMA et al. 2013).

Geographic distribution: Distributed all over the Indomalayan Region, with occurrence in transition areas and adjacent parts of the Palaearctic Region (Nepal, southern and south-eastern continental China, Taiwan, Japan).

Identification: DEUVE (2001, 2002, 2005), SONG et al. (2018).

***Eustra nageli* Deuve, 2005** (Fig. 1)

Eustra nageli Deuve, 2005 [30 Sept]: 103 (103-104, 105 fig.1). Type locality: Nepal, Chitwan National Parc, Saura, leg. S. Bíly, 23 Mai 1988.

Holotype repository: NMB

Host ant: Unknown.

General distribution: NEPAL, known only from the Terai (Chitwan National Parc).

NEPAL: Published record: “Nepal, Parc National de Chitwan, Saura, leg. S. Bíly, 23 Mai 1988” (NMB, DEUVE 2005). “Nepal” (NAGEL et al. 2017b).

Material examined (first non-type material): 3 ex. (1 mutilated), NMW: “Jeniš Ivo leg., Nepal centr., Sauraha, 20.-25.5.1992”.

Dhanya Andrewes, 1919

Dhanya Andrewes, 1919 [1 Oct]: 296 (295-297).

Type species: *Dhanya bioculata* Andrewes, 1919 [1 Oct]: 297 (297-298) (by original designation, not by Stork 1985: 1124).

Included species: This genus is composed of seven species as follows: *Dhanya bioculata* Andrewes, 1919; *Dhanya parallela* Andrewes, 1919; *Dhanya seminigra* Andrewes, 1929; *Dhanya mulu* Stork, 1985; *Dhanya cylindrella* Stork, 1985; *Dhanya andrewesi* Stork, 1985; *Dhanya brancuccii* Deuve, 2007.

Host ants: Unknown. See comment above on *Eustra*.

Geographical distribution: Scattered distribution throughout the Indomalayan Region. One species extends into the transition area to the Palaearctic Region in Nepal.

Identification: STORK (1985), DEUVE (2007).

***Dhanya bioculata* Andrewes, 1919** (Fig. 2)

Dhanya bioculata Andrewes, 1919 [1 Oct]: 297 (297-298).

Type locality: “S.E. Borneo, Martapura, 1891, (Doherty)” (Indonesia: S.E. Borneo, Kalimantan, Martapura, leg. Doherty, 1891).

Holotype repository: NHM

General distribution: NEPAL (see below). INDIA (Meghalaya, Karnataka). THAILAND (first record, see below). VIETNAM. INDONESIA (Mentawai Is., Sumatra, Java, Borneo [Kalimantan], Sumbawa). MALAYSIA (Borneo: Sarawak, Sabah). PHILIPPINES.

NEPAL: Published records: “Nepal” (NAGEL 2003b, CHAUDHARY 2005, NAGEL et al. 2017b).

Material examined: 1 ex., NMB (first detailed country record, reference for record in NAGEL 2003b): “Nepal, Parc National de Chitwan, Saura, leg. S. Bíly, 23 Mai 1988, T. Deuve det.”. 3 ex., NMB: “Nepal, 22.-26.5.1990, Chitwan N.P., Saura, S. Bíly leg.”.

Additional material examined: THAILAND: 1 ex., NMB (first country record): “Thai 28/4-6/5.91, Umphang river, 16°07'N 99°00'E, lgt. D. Král, 1000m / Thailand '91, Thanon Thong Chai, D. Král & V. Kubán”.

***Itamus* Schmidt-Göbel, 1846**

Itamus Schmidt-Göbel, 1846 (nec Loew, 1849) [30 June]: 67

Type species: *Itamus castaneus* Schmidt-Göbel, 1846 [30 June]: 67 (by original monotypy).

Included species: Four species as follows: *Itamus castaneus* Schmidt-Göbel, 1846; *I. dentatus* Andrewes, 1919; *I. cavicola* (B.P. Moore, 1978); *I. deuvei* Tian, 2011.

NB: *Itamus kaszabi* Jedlicka, 1968: 290 (288 fig.6, 290, 291) (cf. LORENZ 1998a,b, 2005a,b) from Vietnam is not an Ozaenini but a member of Scaritinae (see also TIAN 2011).

Geographic distribution: Predominantly Indomalayan including South China, yet absent from the Sunda Archipelago. The genus is also known from adjacent Palaearctic areas in

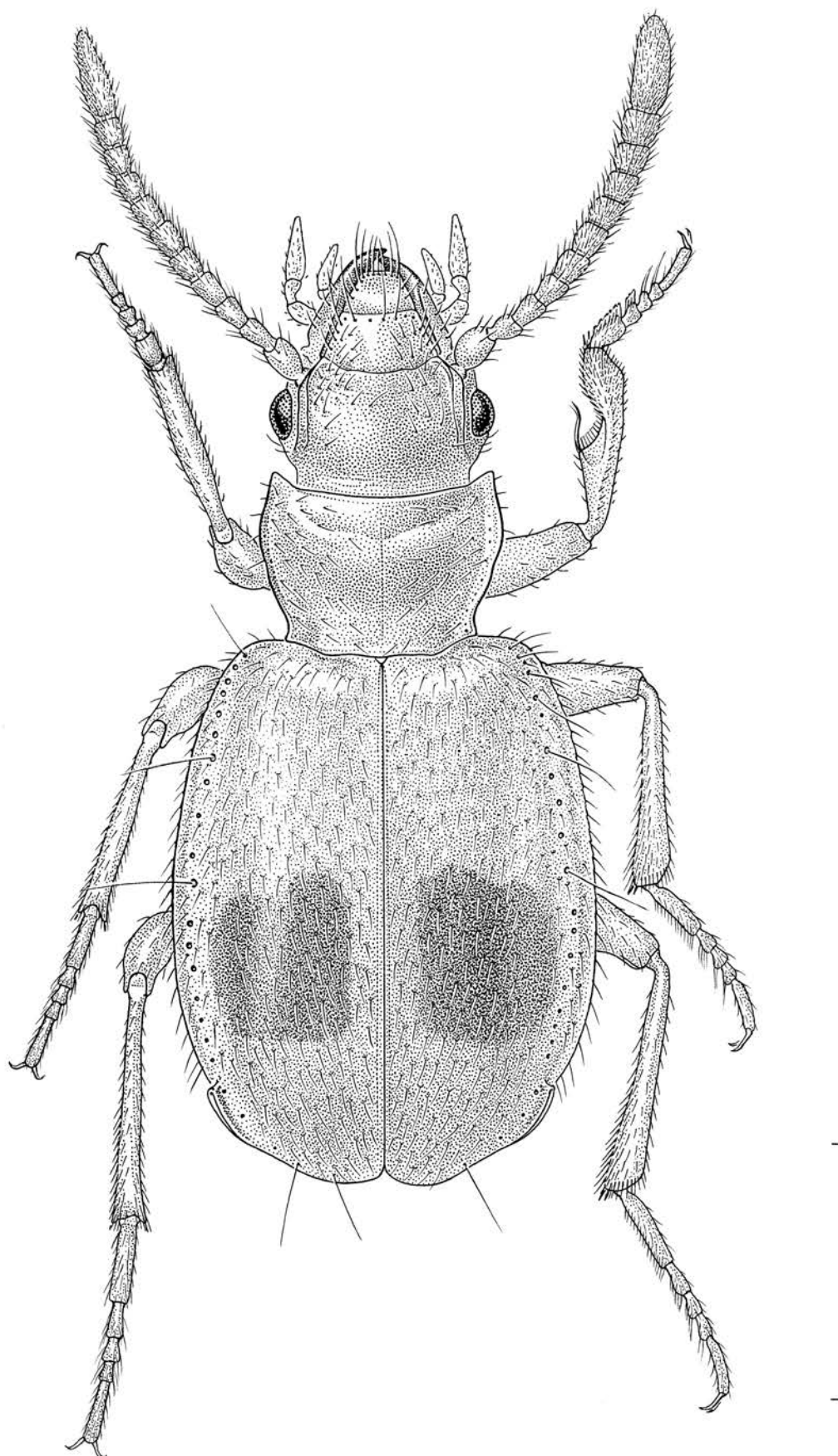


Fig. 1: *Eustra nageli* Deuve. Holotype specimen. ♂. Nepal (NMB). Scale bar: 1 mm. Illustration E. Weber.

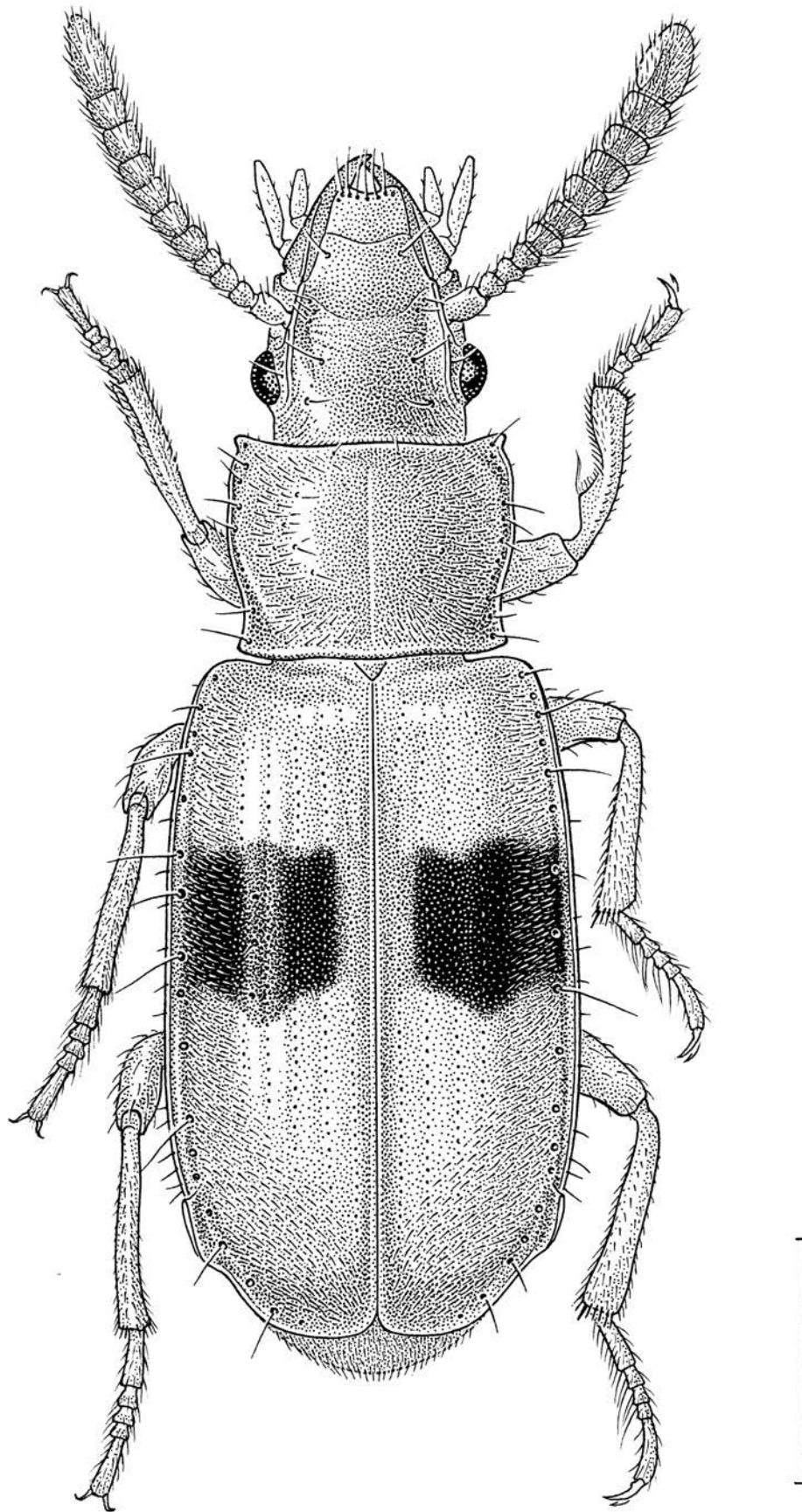


Fig. 2: *Dhanya bioculata* Andrewes. "Nepal, Chitwan National Parc, Saura, 23.V.1988, leg. S.Bily. *Dh. bioculata*, det. T. Deuve 2002" (NMB). Scale bar: 1 mm. Illustration E.Weber.

Pakistan and Nepal. It is represented in the northern Australian Region (New Ireland).

Identification: ANDREWES (1919), BÄNNINGER (1927), MOORE (1978), ZHAO & TIAN (2003), TIAN (2011).

***Itamus castaneus* Schmidt-Göbel, 1846** (Fig. 3)

Itamus castaneus Schmidt-Göbel, 1846 [30 June]: 67

Type locality: “Birma” (Myanmar). The introductory text by SCHMIDT-GÖBEL (1846) allows a slightly more precise localization: Birma, Tenasserim, 1837-1839, leg. J.W.Helfer (see also ANDREWES 1923, WOLCOTT & RENNER 2017).

Holotype repository: NMPC

Note: Most characters described for *I. castaneus* fit to the specimen from Vietnam illustrated in Fig. 3 (such as the size, the number of setae at the anterior border of the labrum and the absence of a tooth at the inner fore femur) yet recently several new specimens from new regions were recorded and some of the established specific characters seem to be variable. It is therefore with reservation that I assign the illustrated specimen to *I. castaneus*.

General distribution: PAKISTAN (Sindh). NEPAL (see below). INDIA, mainland (Chota Nagpur [probably Bihar], Assam, Karnataka, Tamil Nadu). SRI LANKA. ANDAMAN Is. (India). MYANMAR. THAILAND. LAOS. VIETNAM. CHINA (Guangdong).

NEPAL: Published records in HARTMANN (2015: 10) (cf. Thapa 2015:543): Bheri province, Banke district, Nepalgunj, Hotel Sneha, 28°02'41"N, 81°37'17"E, 140 m, 5.VII.2009, leg. M.Hartmann, A.Kopetz, at light; Bheri prov., Banke dist., Nepalgunj, City, Hotel Batika, 200 m NN, 30.V.1997, leg. M.Hartmann, at light; Narayani prov., Chitwan, 13 km W Sauraha, Kasara, Chitwan NP, 27°33'07"N, 84°21'59"E, 20.VI.2005, leg. A.Weigel, deciduous forest; Narayani prov., Chitwan, 2 km NW Sauraha, 180 m, 27°34'56"N, 84°30'01"E, 20.VI.2005, leg. M.Hartmann, A.Weigel, community forest.

Material examined: MYANMAR: 1 ex., Coll.Wrase: “Myanmar, Shan State, 20km NW Kalaw, 10.VI.2015, N20.69495° E96.50204°, 541m, Walter Grosser lgt., Collection, Zdenik Malinka, Opava, Czech Rep.”. THAILAND: 2 ex., MHNG: “Thailande, Chiang Mai, Chiang Dao, grotte, 11.VII.85, L. Deharveng.”. VIETNAM: 1 ex., NMB, see Fig. 3, doubtful species assignment: “Vietnam N., Cuc Phuong, 2.-11.V.1991, leg. Jan Strnad”.

Protopaussini Gestro, 1892

***Protopaussus* Gestro, 1892**

Protopaussus Gestro, 1892 [27 July]: 706 (706-707)

Type species: *Protopaussus feae* Gestro, 1892 [27 July]: 707 (707-708, fig.) (by original monotypy).

Geographic distribution: Predominantly Indochinese (including southern and southeastern China), Sundaic and Wallacean distribution, with extensions into the Himalayan subregion in Nepal and northern India.

Included species: Eight species with *Protopaussus basilewskyi* omitted as syn.nov. and *Protopaussus vignai* sp.nov. included as follows : *Protopaussus feae* Gestro, 1892 ; *Protopaussus walkeri* Waterhouse, 1897 ; *Protopaussus javanus* Wasmann,

1913 ; *Protopaussus bakeri* Heller, 1914 ; *Protopaussus almorensis* Champion, 1923 ; *Protopaussus jeanneli* Luna de Carvalho, 1960 ; *Protopaussus kaszabi* Luna de Carvalho, 1967, *Protopaussus vignai* sp.nov., see below.

The subgeneric classification of *Protopaussus* and some species delimitations are not unanimously resolved. The criteria used by LUNA DE CARVALHO (1989) to separate subgenera are fluid, such as the elytral colour pattern or the shape of the antennomeres.

Host ants: Unknown. Particularities of the body, including the distinctly produced trichomes are indicative of a myrmecophilous life. No host ant has yet been reported.

Identification: FOWLER (1912), WASMANN (1913), RIBEIRO (1930), LUNA DE CARVALHO (1989).

***Protopaussus almorensis* Champion, 1923** (Fig. 4)

Protopaussus almorensis Champion, 1923 [28 Feb]: 44 (44-45).

Type locality: “Sitoli, Central Almora Division, U.P. (H.G.C.: 21.vii.1921)”. India, Uttarakhand, Central Almorah Division, Sitoli, collected in July 1921 by Harry George Champion, at that time forestry officer and geographer in Dehra Dun (species description by his father George Charles Champion).

Holotype repository: NHM

New synonymy: *Protopaussus basilewskyi* Luna de Carvalho, 1967, **syn. nov.** of *Protopaussus almorensis* Champion, 1923. *Protopaussus almorensis basilewskyi* Luna de Carvalho, 1967 [31 Dec]: 264 (262-264, figs 9,12,13) (Unavailable from Luna de Carvalho 1960: 147, fig.4, and Luna de Carvalho 1965: 5, 10 figs. 1,3,6, 11, cf. ICZN §45.5, 45.6). Status changed from subspecies to *species propria* by NAGEL (2003a).

Type locality: “Darjeeling”. India, West Bengal, Darjiling.

Holotype repository: Coll. Luna de Carvalho, California Academy of Sciences, San Francisco, U.S.A.

Notes on *Protopaussus almorensis* and *Protopaussus basilewskyi*:

CHAMPION (1923) could not describe any variability in the colour pattern of the elytra because he had only the holotype specimen available (the sex was not determined). His description of the elytral colour was given as black except at the extreme base rufo-ferruginous. Also, the antennae were described as black with the tip of antennomere 11 rufo-ferruginous. LUNA DE CARVALHO (1960, 1965, 1967, 1989) describes the elytra of *Prot. almorensis basilewskyi* as completely black (including the shoulders) except a very small light area at the basal constricted part (near pronotal peduncle). The variation in the colour pattern of several specimens from different localities now available to me comprises 1) black elytra with narrow or wider yellowish ferruginous base of elytra only (= possibly typical *almorensis*), 2) one additional small, elongate-oval ferruginous patch on the disk on both sides in front of the subapical flange, 3) these small patches very dark and hardly recognizable, and 4) elytra completely black except a small clearing at the middle of the base (= ab. *basilewskyi*). Hence, *Prot. basilewskyi* is a (nomenclaturally irrelevant) aberration as originally classified by LUNA DE CARVALHO (1960, 1965) rather than a nomenclatural relevant subspecies (LUNA DE CARVALHO 1967) or a *species propria* (NAGEL 2003a,b, NAGEL et al. 2017). The recent data require the new synonymization documented above.

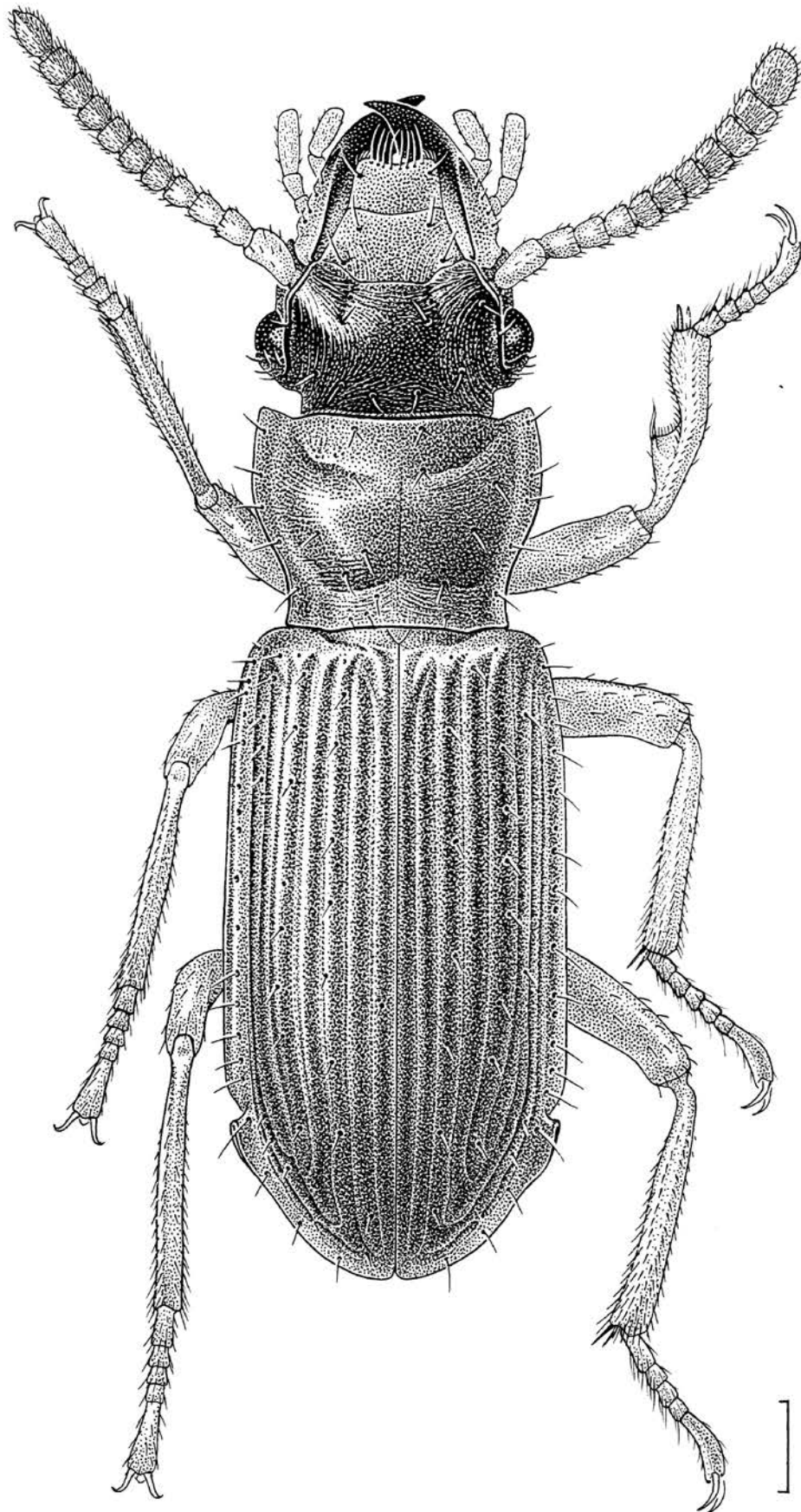


Fig. 3: *Itamus* aff. *castaneus* Schmidt-Göbel. „Vietnam N., Cuc Phuong, 2.-11.V.1991, leg. Jan Strnad” (NMB). Scale bar: 1 mm. Illustration E.Weber.

Specimens from Sikkim and Darjiling (recorded by NAGEL 1997) show the following variation in colour pattern: The Kalimpong, Hitli (Darjiling) specimen (Fig.4) has the elytra black except the ferruginous basal part; the Suruk (Darjiling) specimen shows distinct light subapical patches in addition. The Sikkim specimen has the elytra totally black except a very small light area touching the pronotal pedicle which corresponds to the description of “*basilewskyi*”.

There is also some variation in the relief of the pronotum: the Yunnan specimens show one small, shallow depression each at the dorsal lateral angles of the elevated anterior portion. Such structure is absent or only weakly marked in the specimens from Sikkim, Darjeeling or Nepal. At present I regard these differences as clinal geographic variation and not as characters of distinct species-group taxa.

General distribution (cf. NAGEL 1997): NEPAL (see below). INDIA (Uttarakhand, Darjiling, Sikkim). CHINA (Yunnan, see note above).

NEPAL: Published records: „Nepal“ (as “*Protopaussus basilewskyi*”: NAGEL 2003b, CHAUDHARY 2005, NAGEL et al. 2017b). Detailed record, reported as *Protopaussus almorensis* in NAGEL (1997), as follows:

Material examined: 1 ex., NMB: “O-Nepal, Arun R., Lamobagar Gola [27°39'N 87°21'E], 1400 m, 28.-31.v.1980 (C.Holzschuh), NMB” (This specimen was again examined for the present study. It has the base of the elytra ferruginous and lacks the small, reddish, subapical patches on the black elytra).

Additional material examined (subsequent to NAGEL 1997): CHINA (Yunnan): 1 ex., IZCAS: „[Chinese characters]; 686-935 m; [Chinese characters], 24.66530°N, 97.59134°E, 24.66802°N, 97.59908°E, 2008.06.01 [= 1 June 2008]; [Chinese characters] // IOZ(E) 1065699 // Yunnan [handwritten, localization of Lat.-Long. data]”. 1 ex., NMPC: “China: Yunnan province. Mazhan env., 6.VI.2007, Volcano Geological Park, 25°13.5'N 98°30.0'E, 1930m, J.Hajek & J.Ružička leg. / Individually collected on soil surface, on plants and flowering shrubs, ruderalized grasslands on volcanic rocks, grove margins”. INDIA (Darjiling): 1 ex. MNHN: “Inde Anglaise, Pedong, Région de Darjeeling. Chasseurs indigènes, 1935 / Museum Paris, 1952, Coll.R.Oberthür”. 1 ex., MNHN: “dto, but with additional label: *Protopaussus almorensis* Champ., compared with type, G.J.A.” (in both specimens subapical, small, light markings present on elytra).

Protopaussus vignai sp. nov. (Fig. 5)

Holotype (here designated), ♀: Specimen dry mounted, glued to a pinned, perforated, rectangular card, left middle leg wanting, gonocoxae projecting.

White label: “NEPAL 1200 Tatopani / Khali Ghandaki Valley / IV.1987 A. LOY, leg. // *Protopaussus almorensis* Champ. / Nagel det. 1989 // ♀ // Coll. Vigna Taglianti [handwritten, added by P.Nagel in 1989] // Red label: HOLOTYPUS / *Protopaussus vignai* / P.Nagel, 2018.

Holotype repository: Andrea di Giulio Collection, Università degli Studi Roma Tre, Rome, Italy (ADGC).

Diagnosis: Elytra pubescent, black with base flavo-ferruginous. Tibiae without longitudinal striae. Antennomeres 8 to 10 short cylindrical, distinctly wider than long. Antennomere 11 ovoid. Pronotum with anterior dorso-lateral trichome visible at

dorsal view. Pronotum longitudinally channelled in the middle of anterior and posterior part, with basal pedicle included. Pronotal excavation without trace of central longitudinal carinula.

Description. Standardized body length (in dorsal view, frontal margin of head until hind margin of elytra): 6 mm, width across elytra 2 mm.

Colour. Body flavo-ferruginous with posterior basal angles of pronotum, antennae and legs dark, and head ferruginous. Elytra black with base flavo-ferruginous.

Surface structure and microsculpture. Dorsal head with coarse and dense punctuation, each puncture with a short, slanting seta. Pronotum glabrous. Punctuation of anterior portion of pronotum less coarse and less dense. Transverse cleft and posterior basal angles smooth and shining. Pronotal basal pedicle with shallow punctuation. Elytra shining, regularly set with large punctures. Elytra pubescent with long setae except central, dorsal disc (abrasion unlikely).

Head broad, tumid, with bisinuate impression posteriorly. Eyes small and enclosed by slightly prominent borders of the head capsule (female!). Eyes with anterior outline semicircular and posterior outline almost straight.

Mouth parts similar to *Prot. almorensis* and *Prot. feae*.

Antennae with antennomere 1 (scape) elongate, large. Antennomere 3 a little more elongate than the globular 4 and clearly larger than the small antennomere 2. Antennomeres 8 to 10 cylindrical and increasingly wider than long and slightly dilated. Terminal antennomere ovoid, at broadest view 1.4 times longer than wide, with lateral margins convex, not parallel.

Pronotum 1.2 times wider than long. Anterior part narrower than posterior part, crescent-shaped, with lateral dorsal lobes segregated from central portion by wide, shallow, furrows. Yellowish tuft of setae of the anterior dorso-lateral trichome directed obliquely backwards and visible at dorsal view. Pronotum with transverse, deep, large excavation. Pronotum with a longitudinal channel almost reaching the anterior and posterior margins, and absent at the bottom of the excavation. Posterior angles strongly produced, apically with large tuft of setae directed backwards and touching the forward directed shoulders.

Elytra elongate, parallel-sided, dorsally explanate, twice as long as wide. The apex is bent downwards and covers the pygidium for the most part. Shoulders strongly produced and directed forwardly.

Hind wings present.

Pygidium not marginate, largely covered by elytra.

Tibiae compressed, dilated, finely pubescent, smooth, shining, not longitudinally striated.

Gonocoxae long, narrow, closely attached to each other, bifid only at extreme apex.

Distribution. Only known from the type locality in Nepal.

Type locality: Nepal, District Myagdi, upper valley of the Khali Ghandaki River, Tatopani village [28°29'46"N 83°39'12"E], 1200 m a.s.l., collected by A.Loy in April 1987.

Etymology. The species is named for the renowned entomologist and biogeographer Augusto Vigna Taglianti, Professor emeritus of the University of Rome. He once dedicated one copy of the newly published Fauna d'Italia volume on Carabidae 1 to me, a beginner, as a contribution to our discussion on Paussinae. This clearly stimulated my further research and I am very grateful for the privilege of knowing him for a long time. The specific epithet is a proper noun in the genitive case,

derived from the first part of his family name.

Discussion: At first glance this new species appears to be similar to *Protopaussus almorensis* Champion, 1923 and I originally reported this holotype specimen as that species (NAGEL 1997, p. 362). Whilst details in colouration pattern is a variable character in *Protopaussus*, the formation of the antennomeres and of the pronotum are constant in those species of which several specimens have been studied.

Paussini Latreille, 1806 (Ant Nest Beetles, Fühlerkäfer)

Cerapterina Billberg, 1820

***Cerapterus* Swederus, 1788**

Cerapterus Swederus, 1788 [30 Sep]: 203

Type species: *Cerapterus latipes* Swederus, 1788 [30 Sep]: 203 (203-204, plate VI figs 1-6) (by original monotypy).

Geographic distribution: Afrotropical and Indomalayan Regions.

The division of the genus into subgenera is debated. Whenever subgenera are used, the five Asian species are attributed to the nominate subgenus. They are widely distributed in the whole Region including the Indian subcontinent, the Indochinese mainland, the Greater Sunda Islands and Philippines. Their ranges extend into the transition zone to the Palearctic Region along the southern slopes of the Himalaya.

Included species (Indomalayan Region): Five species as follows: *Cerapterus latipes* Swederus, 1788; *Cerapterus horsfieldii* Westwood, 1833; *Cerapterus quadrimaculatus* Westwood, 1841; *Cerapterus herrei* Schultze, 1923; *Cerapterus drescheri* Reichensperger, 1935.

Host ants: *Myrmicaria* spp. is reported for an Indomalayan species of *Cerapterus*, see below.

Identification of Indomalayan species: KOLBE (1926, 1927, 1928), REICHENSBERGER (1935), LUNA DE CARVALHO (1989).

***Cerapterus quadrimaculatus* Westwood, 1841** (Fig. 6)

Cerapterus quadrimaculatus Westwood, 1841b (11 Aug): 583

Type locality: "Insula Java". Indonesia: Java.

Holotype repository: ZMUC

Synonym: *Cerapterus quadrimaculatus austerus* Reichensperger, 1935 [28 Feb]: 2 (2-3).

Type locality: „Preanger, R.Menzel ded.“. Java, Preanger, submitted by R. Menzel.

Holotype repository: ZFMK.

Note: The elytral colour pattern is variable in that the basal patches are sometimes very small or absent. Reichensperger's (1935) "*Cerapterus quadrimaculatus* var. *austera*" (sic!) is maintained by NAGEL et al. (2017b) as synonym (with mandatory change of ending) rather than regarded as unavailable (cf. ICZN § 45.6.4). The characters described by REICHENSBERGER (1935) are not limited to the elytral colour pattern but also comprise a specific type of elytral punctuation which would not even exclude the classification as a *species propria*.

REICHENSBERGER (1935) points to the variability especially of the elytral and pronotal colour pattern of the Asian species. Elytral punctuation, shape of terminal labial palpomere and of the antennal club are also important characters. The criteria to distinguish between species are sometimes overlapping.

Host ant: *Myrmicaria brunnea subcarinata* (F.Smith, 1857) (Myrmicinae, Myrmicariini) was reported as host ant of an Indomalayan *Cerapterus* of disputed identity from Sumatra (*C. quadrimaculatus*, *C. horsfieldii* or *C. drescheri*) (WASMANN 1916, REICHENSBERGER 1935). The label "*Myrmicaria brunnea carinata*" [= *Myrmicaria carinata* (F. Smith, 1857)] is attached to a specimen of *C. quadrimaculatus* with ant from Java (NMB), see below, material examined.

General distribution: NEPAL (first detailed record, see below). THAILAND (first record, see below). LAOS (Attapeu prov.) (first record, see below). CHINA (Yunnan). INDONESIA (Sumatra, Java). MALAYSIA (Malay Peninsula) (first record, see below).

NEPAL: Published records: "Nepal" (NAGEL 2003b, CHAUDHARY 2005, NAGEL et al. 2017b).

Material examined (first detailed record), 1 ex., HNHM: "Nepal, Pipley [3 km E of Hetaura/Hetauda], 25.VIII.-10.IX.1969, leg. Woynarovich".

Additional material examined: LAOS (first record) : 1 ♂, NMB: "Attapeu prov., Thong Kai Ohk, Ban Kachung, (Mai) env., 1200m, 15°01'N 107°27'E, 20.-23.VI.2011, light trap // NHMB Basel, Laos 2011 Expedition, M.Brancucci, M.Geiser, D.Hauck, Z.Kraus, A.Phantala & E.Vongpachan". CHINA: 1 ex., NME: "S-China, S-Yunnan, (Xishuangbanna), 24 km N Jinghong, Naban, 700m, 6.6.20 08, {LF/FI//F la Pmann/Pununn} [difficult to read]". 1 ♂, IZCAS: 927m, 2009 VIII 10, N Shi H.L. coll., light trap, Inst. Of Zoology, CAS, [Chinese characters] / China, Yunnan, Dehong, Ruili, Nongdao, Dengga village, N23.95285, E97.59808 / IOZ (E) 1065700". 1 ♂, IZCAS: "[transcription from Chinese original: Yunnan, Cangyan, China Science Institute / 1980 V 16, Collector: Song Shi Nei] / IOZ (E) 1472327". INDONESIA, Java: 1 ex., OUMNH: "Gunong Berunt [handwritten, difficult to read, possibly: Java, Gunung Beureum], F.M.S., May 1917, F. de la M.N.Coll.". 1 ex., NHMM: "J.B.Corporaal, Java, Preanger, Tjigembong, XII.14 // *C.horsfieldi*". 1 ex., NHMM: "Ardja-Sari, Preanger, Java / ex Coll. Veth, Rijksmus. Leiden". 1 ex. NHMM: "Buitenzorg, C..., Fr.A.Th.H.Verbeek, 30-12-20". 1 ex., NHMM: "C.O. Nandjoang-Djaja / G.Simpai, 600 m, Preanger, Jan 1934/ leg. C.P.J. de Haas". 1 ex., NHMM: "G.Gedeh, Java, Drescher, VI.1930, Og Tjikopo Zuid". 2 ex., NMB: dto. 1 ♂, BGUB: dto.. 1 ex., NMB: "Batoerraden, G.Slamet, Java, F.C.Drescher, III.1936". 1 ex., NMB: „F.C.Drescher, G.Tangkoeban Prahoe, 4000-5000 Voet, Preanger, Java, I.1937 / with ant: *Myrmicaria brunnea carinata*". 1 ex., ZMUC: „Java, Skovgaard leg., Zool. Museum, DK Copenhagen“. MALAYSIA, Malay Peninsula (first record): 1 ♀, BGUB: "West-Malaysia, Selangor, Ulu Gombak Field Studies Centre, 30km N Kuala Lumpur, 250 NN, 25.X.1991, ca 22h, am Licht, leg. K.Fiedler, Würzburg". THAILAND (first record), 1 ex., BGUB: "N-Thailand, Chiang Mai University, 20.IX.19.., leg. Viengkhanh". 3 ex., NMB: "Thailand '91, Thanon Thong Chai, D.Král & V.Kubán / THAI, 9.-14.V.1991, Chiang Dao, 350m, 19°22'N 98°57'E, Vit Kubán leg.".

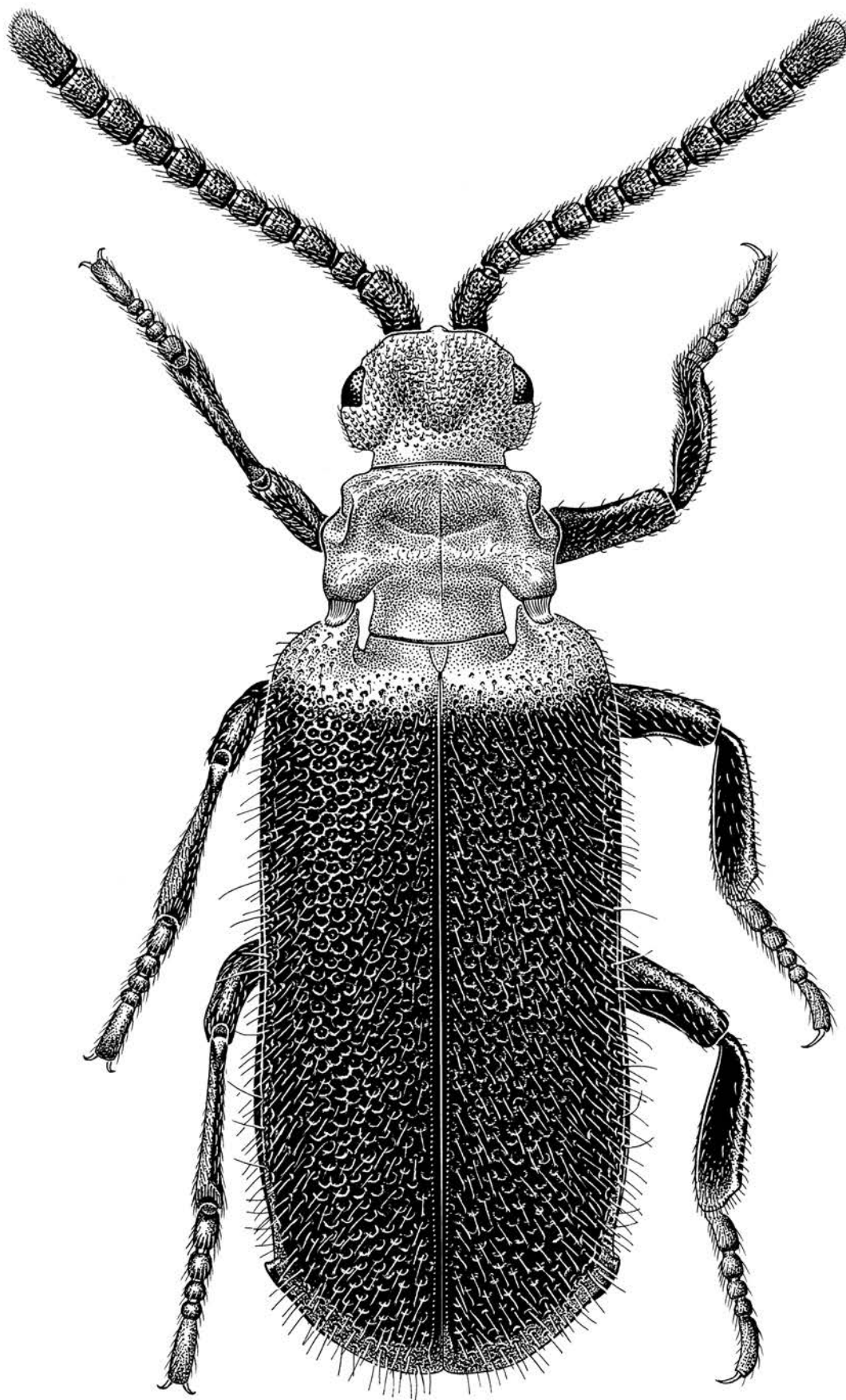


Fig. 4: *Protopaussus almorensis* Champion. "India, Darjeeling, Kalimpong, Hitli, 900m, 8.V.1987, leg. Ch.J.Rai" (NMB). Scale bar: 1 mm. Illustration E.Weber.

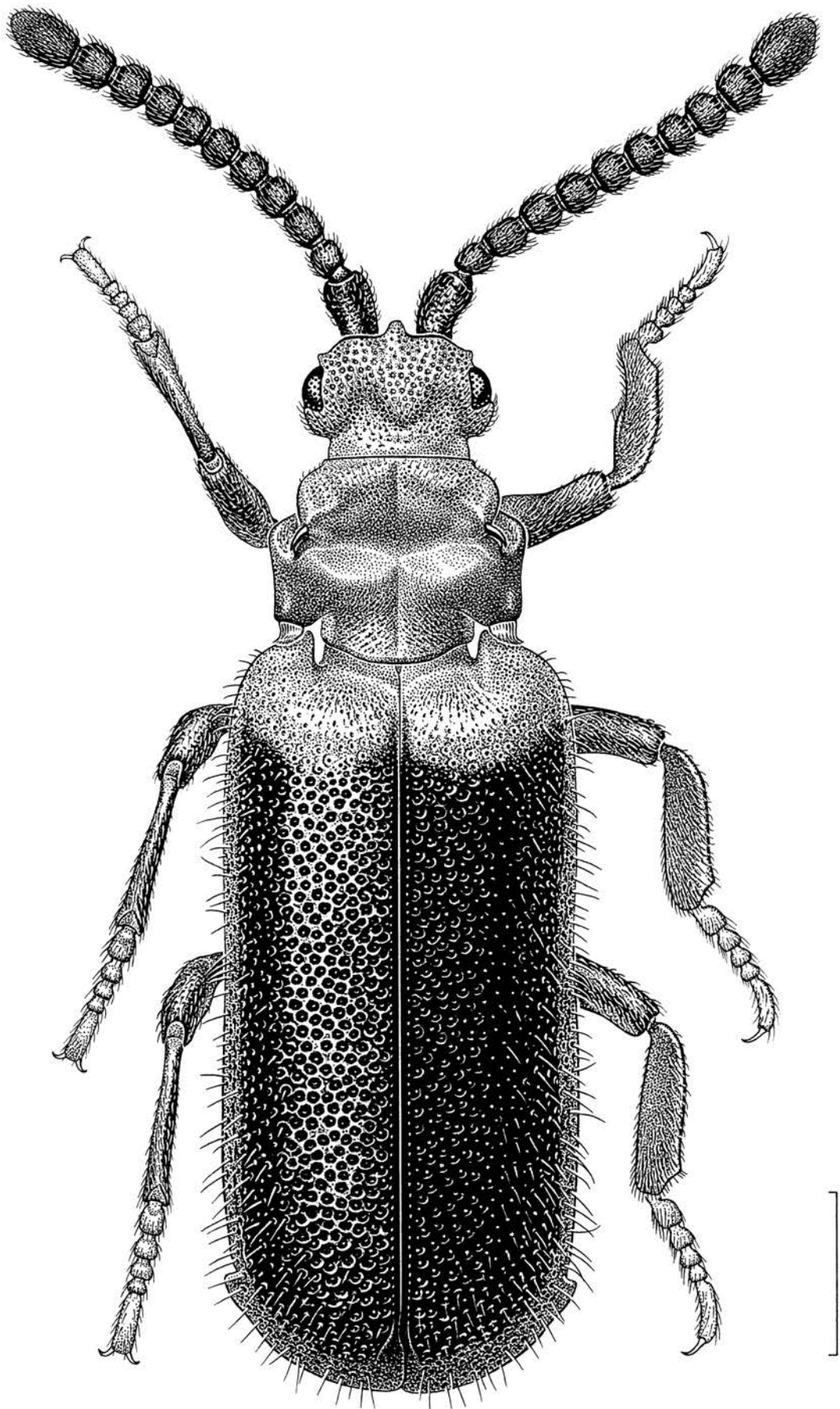


Fig. 5: *Protopaussus vignai* sp. nov. Holotype specimen. ♀. Nepal (ADGC). Scale bar: 1 mm. Illustration E. Weber.

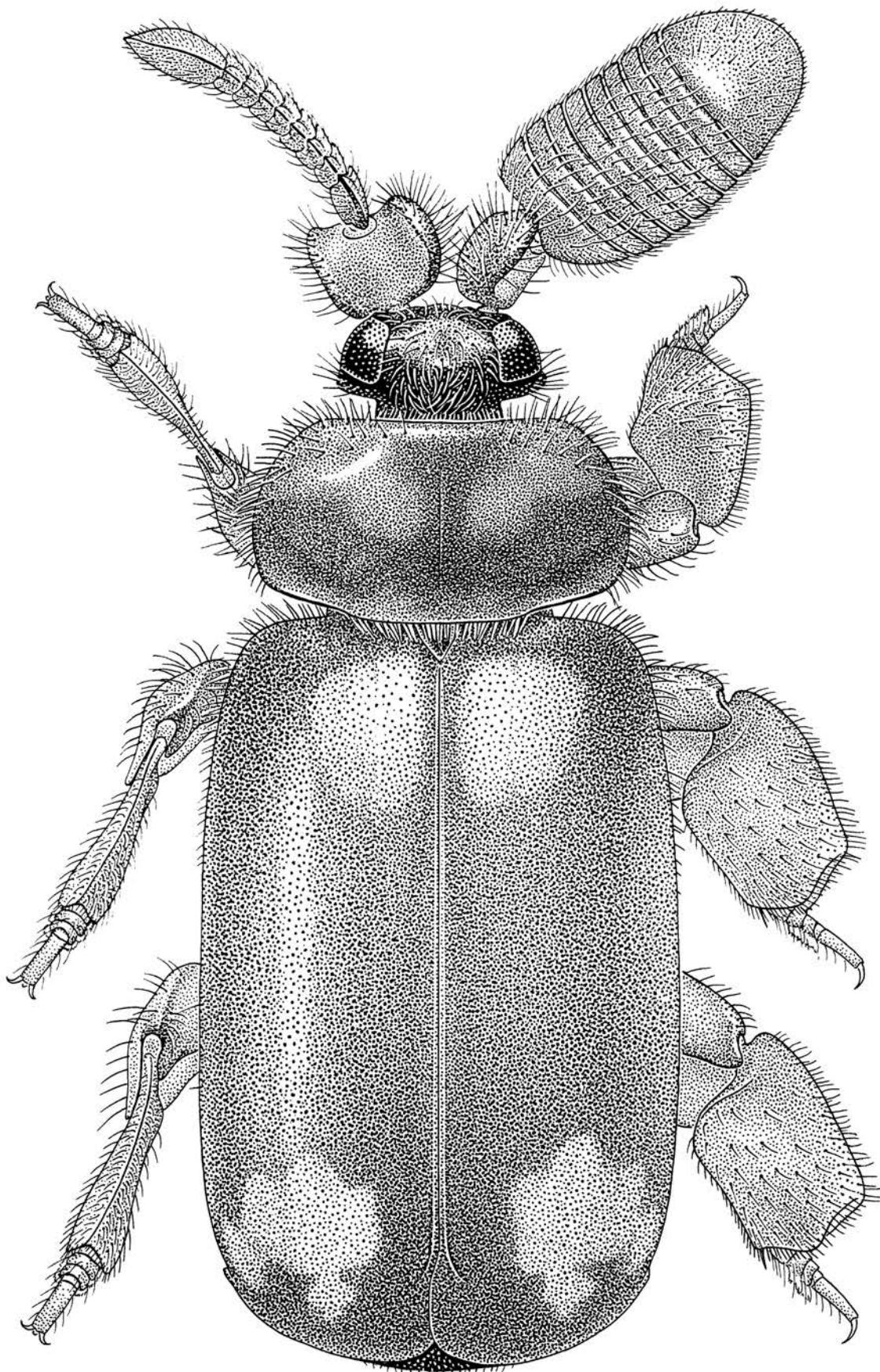


Fig. 6: *Cerapterus quadrimaculatus* Westwood. ♀. "W. Java, G. Megamendoeng, 700 m, IVVI. 1936, M. A. Liefstinck". Scale bar: 1 mm. Illustration E. Weber.

Platyrhopalina Jeannel, 1946**Platyrhopalus Westwood, 1833**

Platyrhopalus Westwood, 1833 [19 March]: 654

Type species: *Pausus denticornis* Donovan, 1804 [1 June]: pl. 5 (plate without number, number “5” according to p. 1 of Index, 2 pp. unpaginated text) (by original designation).

Included species: see lists in LORENZ (2005b) and NAGEL et al. (2017b). Thirteen species as follows: *Platyrhopalus denticornis* (Donovan, 1804); *Platyrhopalus acutidens* Westwood, 1833; *Platyrhopalus westwoodii* Saunders, 1838; *Platyrhopalus intermedius* Benson, 1846; *Platyrhopalus castelnaudii* Westwood, 1874; *Platyrhopalus irregularis* Ritsema, 1880; *Platyrhopalus comottii* Gestro, 1882; *Platyrhopalus davidis* Fairmaire, 1886; *Platyrhopalus paussoides* Wasmann, 1904; *Platyrhopalus quinquepunctatus* (Shiraki, 1907); *Platyrhopalus mandersi* Fowler, 1912; *Platyrhopalus tonkinensis* Janssens, 1948; *Platyrhopalus imadatei* (Chûjô, 1964).

Host ants: Documented evidence (collected from nest) for an association of *Platyrhopalus* with an ant species exists for *Pheidole* sp. (Myrmicinae, Pheidolini) (see *Platyrhopalus denticornis* below, and SONG et al. 2018). Other reports on host ants are based on beetles which were collected together with ants which does not necessarily document a true association: *Solenopsis geminata* (Fabricius, 1804) (Myrmicinae, Solenopsidini) (RIBEIRO 1930), *Hypoponera* aff. *truncata* (F. Smith, 1860) (Ponerinae, Ponerini) (GESTRO 1888), *Tetramorium* sp. (Myrmicinae, Tetramoriini) (SONG et al. 2018).

Geographic distribution: Indomalayan including southern and southeastern continental China and Taiwan, not recorded from Sunda Islands. Extending into the transition areas to the Palaearctic Region in Afghanistan, Pakistan, southern slopes of the Himalaya. In China the genus occurs as far north as Beijing (material examined) and Liaoning (LI 1992).

Identification: FOWLER (1912), LUNA DE CARVALHO (1989).

***Platyrhopalus denticornis* (Donovan, 1804) (Fig. 7)**

Pausus denticornis Donovan, 1804 [1 June]: pl. 5 (plate without number, digit *teste* Index p. 1, and 2 unpaginated text pages)

Type locality: “vicinity of Bengal”. At that time, around 1800 “Bengal” comprised mainly the Gangetic and Brahmaputra plains, including today's Bangladesh.

Holotype repository: NHM (?)

Synonym, new aspects: *Pausus denticornis* Illiger, 1804 [22 Apr]: 113, senior synonym of *Pausus denticornis* Donovan, 1804 [1 June].

The name introduced by Illiger predates *Pausus denticornis* Donovan. Until recently, Donovan's work has been dated “1800” from the work's title page, hence regarded as prior to Illiger (1804). *Platyrhopalus denticornis* (Illiger) has always been regarded a synonym of *Platyrhopalus denticornis* (Donovan) and has not been used as a valid name after 1899 (ICZN 1999, §23.9.1.1) (not by LUNA DE CARVALHO's (1951: 21) nomenclatural act either). The junior synonym *Platyrhopalus denticornis* (Donovan) has been constantly accepted as the valid name. It would cause confusion when we would newly use the actually senior synonym. Therefore, reversal

of precedence should be applied. Given the small number of experts at any time, ICZN (1999) § 23.9.1.2 cannot be met literally. The case is to be referred to the Commission and the use of the junior synonym is maintained in the meantime (following ICZN 1999: §23.9.3).

Type locality: “India Orientali. Dom. Prof. Schumacher.” (GYLLENHAL IN SCHÖNHERR 1817: 14).

Synonym: *Platyrhopalus unicolor* Westwood, 1833 [19 March]: 659 (659-660, 682, pl. 33 fig.49). Westwood knew *Pausus denticornis* Illiger, 1804 [22 Apr] only from GYLLENHAL's (1817) description. He regarded it as a species different from *Pausus denticornis* Donovan, 1804 [1 June]. At that time he dated Donovan's description as 1800, the date on the title page of Donovan's work, and, consequently, regarded Illiger's species as a junior synonym. He therefore newly described *Pausus denticornis* Illiger as *Platyrhopalus unicolor*.

Type locality: see *Pausus denticornis* Illiger.

Synonym: *Platyrhopalus cardoni* Wasmann, 1904 [31 Oct]: 19 (19-20). Synonymized with *Platyrhopalus denticornis* Donovan by NAGEL et al. (2017a,b).

Type locality: “Barway, Chota-Nagpore, R.P. Cardon S.J., 1897”. India, Chotanagpur, Barway parish, probably Chainpur, Bihar.

Synonym: *Platyrhopalus illigeri* Luna de Carvalho, 1951 [31 Dec]: 21 (Replacement name for *Pausus denticornis* Illiger, 1804 which LUNA DE CARVALHO (1951) treated as “var.” of *Platyrhopalus denticornis* (Donovan)).

Synonym: *Platyrhopalus denticornis* ssp. *exclamationis* Luna de Carvalho, 1977 [31 March]: 86 Type locality: “Indes Or. Int., M.H. de Sauss.” Possibly in the interior of the Indian subcontinent, M.H. de Saussure.

Note: The elytral colour pattern is variable, from a uniform chestnut brown (“*Platyrhopalus unicolor* Westw.” = “*Pausus denticornis* Illiger” = “*Platyrhopalus denticornis* (Don.) var. *illigeri* Luna de Carvalho”) through longitudinal light bands by connection of the fore and hind areas on each elytron (“*Platyrhopalus exclamationis* Luna de Carvalho”) to four separate light areas (“*Platyrhopalus denticornis* (Donovan)”). Sometimes the basal patches unite at the suture (see FOWLER 1912, p.460, fig.209).

Host ant: *Pheidole latinoda* Roger, 1863 (Myrmicinae, Pheidolini) (WASMANN 1904).

General distribution: PAKISTAN (Azad Kashmir, Khyber Pakhtunkhwa, Punjab). NEPAL (see below). INDIA (Punjab, Uttarakhand, Uttar Pradesh, Delhi, Bihar, W-Bengal (outside Darjiling), Darjiling, Assam, Rajasthan, Madhya Pradesh, Jharkhand, Maharashtra, Karnataka, Tamil Nadu).

“THIBET” (RAFFRAY 1886: 39): perhaps reference to material sent to Paris by the French priest Armand David from Moupin (Baoping) district in CHINA, Sichuan, during 1869). “TIBET” (ATKINSON 1891: 161): refers to a specimen deposited at the “Indian Museum, Calcutta”.

NEPAL: Published records: “Nepal” (NAGEL 2003b, CHAUDHARY 2005).

Material examined (first detailed records): 1♂, NMB: „Narainghat 6 km NW, 250m, 30.V., Nepal, W.Wittmer, C.Baroni Urbani / [with ants]”. 1 ex., SMNS: “546 Nepal: Sankhua Sabha Distr., Tumlingtar, 300m, 28.V. 1997, leg. W.Schawaller, *Paussus* sp., '98, det. Schawaller”.

Additional material examined: INDIA: 1 ex., BGUB: “Ka-

limpong Umg. [Darjiling], Bhokta Bahadur, IX.1976". 1 ex., BGUB: "Panna Nat. Park, VIII.1988, C-India, MP, Werner leg.". 2 ex., NMB: "[Uttarakhand or Nepal] Siwalik Hills [1 ex. labelled as *Platyrhopalopsis picteti*]". 1 ex., TMP: "Chota Nagpur". 1 ex., MTD: "Chota Nagpore, Barway, 1892". 2 ex., Coll.Pankow, BGUG: "India bor., Cand.occ., 500m, 30.VII-86, Richter leg." [handwritten, all details hardly legible]. 1 ex., MNHN: "Russell, Bengal [small, round label] / *Platyrhopalus denticornis* Donovan, Westwood / Ex Musaeo van de Poll, 1909 / Museum Paris, 1952, Coll.R.Oberthur". 1 ♂, MNHN: "Chota Nagpore, Barway, R.P.Cardon, Juin 1897 / *Platyrhopalus cardoni* n.sp. [red ink, handwritten] / Museum Paris, 1952, Coll.R.Oberthur / E.Wasmann vidit 1904." [= Holotype specimen of *Platyrhopalus cardoni*].

***Platyrhopalus acutidens* Westwood, 1833** (Fig. 8, Plate A)
Platyrhopalus acutidens Westwood, 1833 [19 March]: 661 (660-661, 682, pl.33 fig.50)

Type locality: "brought from Nepal by Major-General Hardwicke". Nepal, leg. Thomas Hardwicke, who collected in India natural history objects (including insects), during the period 1778 until December 1823 (DAWSON 1946).

Holotype repository: NHM.

Synonym: *Platyrhopalus angustus* Westwood, 1838 [5 Sept]: 92 (92-93, pl.10 fig.6, 6a, 6b) (Synonymized as "var." with *Platyrhopalus acutidens* by LUNA DE CARVALHO 1951: 21).

Type locality: "India Orientali. Neemuck, Dom. Downes." India, Madhya Pradesh, Neemuch or Nimach, leg. E.T. Downes.

Synonym: *Platyrhopalus suturalis* Westwood, 1845 [1 Feb]: 161 (161-162, 190, pl.88 figs.1, 1a). (Synonymized with *Platyrhopalus angustus* by WESTWOOD (1845: 190).]

Type locality: "Mhow. July 17, 1839, Captain Boys". India, Madhya Pradesh, Mhow near Indore, leg. W.J.E. Boys [also "Boyes"], 17 July 1839.

Synonym: *Platyrhopalus angustus* var. *major* Wasmann, 1904 [31 Oct]: 20

Type locality: "Sind, ex musaeo Fred. Moore. Oberthür collection" S.E. Pakistan, Sindh prov.

Note: The elytral colour pattern is variable. The normal triangular areas at the middle of each elytron are variable in size and intensity of the dark colour (Fig. 8, Plate A). Quite often two subapical, transverse markings as shown in Fig. 8 are present additionally. These are weak or intensive, smaller or larger. FOWLER (1912: 462) reports "a dark variety" from Purneah district (India, Bihar). Elytra, legs and abdomen wanting in the holotype specimen of *Platyrhopalus acutidens* Westw. already at the time of its description by Westwood. Hence, the colour pattern of the elytra is not known. All *Platyrhopalus acutidens* and *Platyrhopalus paussoides* which I have seen differ in the more distinctly waisted pronotum of *Platyrhopalus paussoides* and the acute yet apically obtuse process at the mesal part of the first antennomere of *Platyrhopalus acutidens*. The dark elytral pattern in *Platyrhopalus paussoides* is more extended and a longitudinal dark marking at the basal suture is often present (as in Fig. 9). *Platyrhopalus davidis* Fairmaire has a stout body, slightly oval antennal club with distinct lateral undulations and the central basal dark marking of the elytra

often extends to and becomes broader towards the scutellum. Yet, also in this species the elytral pattern is variable.

Host ant: The species was reported in company with *Solenopsis geminata* (Fabricius, 1804) (Myrmicinae, Solenopsidini) (RIBEIRO 1930), which documents a possible yet not confirmed association.

General distribution: AFGHANISTAN (Jalalabad, Sarobi). PAKISTAN (Azad Kashmir, Khyber Pakhtunkhwa, Punjab, Sindh). NEPAL (see below). INDIA (Kashmir, Himachal Pradesh, Darjiling, West Bengal (outside of Darjiling), Assam, Andhra Pradesh, Odisha, Madhya Pradesh, Bihar, Jharkhand, Punjab).

NEPAL: Published records: "Nepal" (WESTWOOD 1833). "Nepal, Banepa, ca 25 km E of Kathmandu, 1420m, light trap, 11.IV.1961, leg. Janetschek, det. Luna de Carvalho 1969" (JANETSCHEK 1990, cf. Thapa 2015: 543). "Nepal, Parwanipur, 4 March 1963, leg. Y.L.Yadav" (JOSHI & MANANDHAR 2001: 31, cf. Thapa 2015: 543).

Material examined: 1 ex., NMB: "C.Nepal 1992, Gorkha 27.-30.V., Dorandi Khola, leg. Jiří Moravac"; 1 ex., ZSM: "Nepal, Rapti Tal, Jhawani, 200m, V.1967, Dierl-Forster-Schacht". 1 ex., BGUG: "dto.". 1 ex., CMNH: "Nepal, Parwanipur, Birganj, Coll.R.Davidson, Sept.1971 / Davidson Collection, donated 1986". 1 ex., BGUG: "dto., Sept.1970, at light". 1 ex., CMNH: "Nepal, Janakpur, April 1971, Coll. R.Davidson / Davidson Collection, donated 1986". 1 ♀, ADGC: "Nepal, Lamjung Himai, Nalma-Khudi, 1000m, IV.1987, A.Loy leg.". 1 ex., Kaupp i.l.: "Nepal, Centr., Narayani Zone, Chitawan Distr., Chitawan Nat. P., Saurahan-Thati-Bagh Mara, 200-500m ü.NN, 17.21.V.1996, leg. P.Cechowsky". 2 ex., NME, BGUG: "Nepal, P: Narayani, D: Chitwan, Sauraha, Rapti River, near Hotel Riverside / 190m, N27°34'29" E84°29'55", 26.VI.-02.VII.2011, leg. J.Küßner #55 / coll. Naturkunde-Museum Erfurt". 1 ex., NME: "Nepal, Bheri/Banke, Nepalganj, Hotel Sneha, N28°02'53" E81°36'54", 125m, 05.VII.2009, by light, leg. A.Weigel, #64 / coll. Naturkunde-Museum Erfurt". 1 ex., NHMK: "Royal Bardia National Park, VII-1999, P.K.Shrestha". 1 ex., NHMK: Kanchanpur, VII-1985, P.K.Shrestha". 1 ex., NHMK: "dto., but VIII-1985". 1 ex., NHMK: "Phulchuki, Kathmandu, VI-1986, P.K.Shrestha leg. / *Platyrhopalus paussoides* Wasm. (1904)".

Additional material examined: AFGHANISTAN. 1 ex., ZSM: "O.Afghanistan, Sarobi, 1100m, 16. ... 1961, leg. G.Ebert". PAKISTAN. 1 ex., ZMHUB: "Pakistan, Hohistan, Swat prov., 72°21' E 34°46'N, Marghazar 1300m, 6 July 1992, lgt. Z.Weidenhoffer" [elytra unicoloured, without dark markings]. 1 ♀, MHNG: "Pakistan: Dir / Dir 1600m, 22.V.1983, Besuchet-Löbl". 1 ex., BGUB: "Indus River, Ketī Shah Bela, II.1969, leg. Pilleri". 11 ex., NME, BGUG: "NW-Pakistan, Swat Province, 35°70' [sic!] N, 71°90'E' [sic!], 1400m, Madyan, 19.VI.-4.VII.1971, leg. C.Holzschuh". 2 ex., HNHM: "Pakistan, Margalla Hills, Pir Sohawa, 1000m, 73°08'E 33°49'N / 29.IV.1998, leg. Gy. M.László & G.Ronkay". 1 ex., NMB: "NW-Pakistan, Charsadda". INDIA. 1 ex., IRSNB: "[Odisha] Surada, Gajam district, Indes Anglaies, R.I.Sc.N.B.I.G.". 1 ex., ZMHUB: "[Himachal Pradesh] Kangra Valley, 4500 ft. / Punjab, Dudgeon Coll., 1904-232".

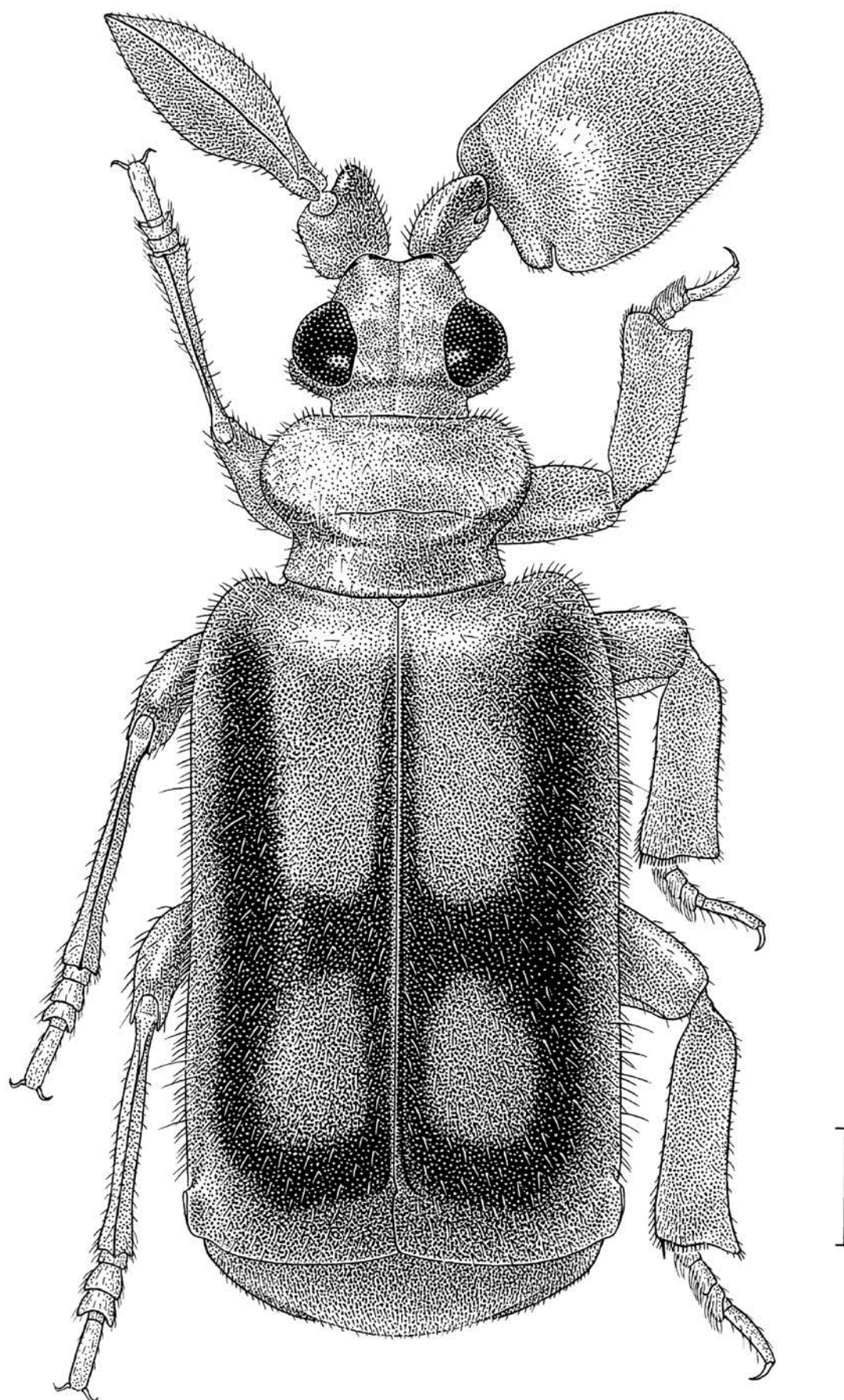


Fig. 7: *Platyrhopalus denticornis* Donovan. "C-India, MP [Madhya Pradesh], Panna National Park, VIII.1988, Werner leg." (BGUB). Scale bar: 1 mm. Illustration E. Weber.

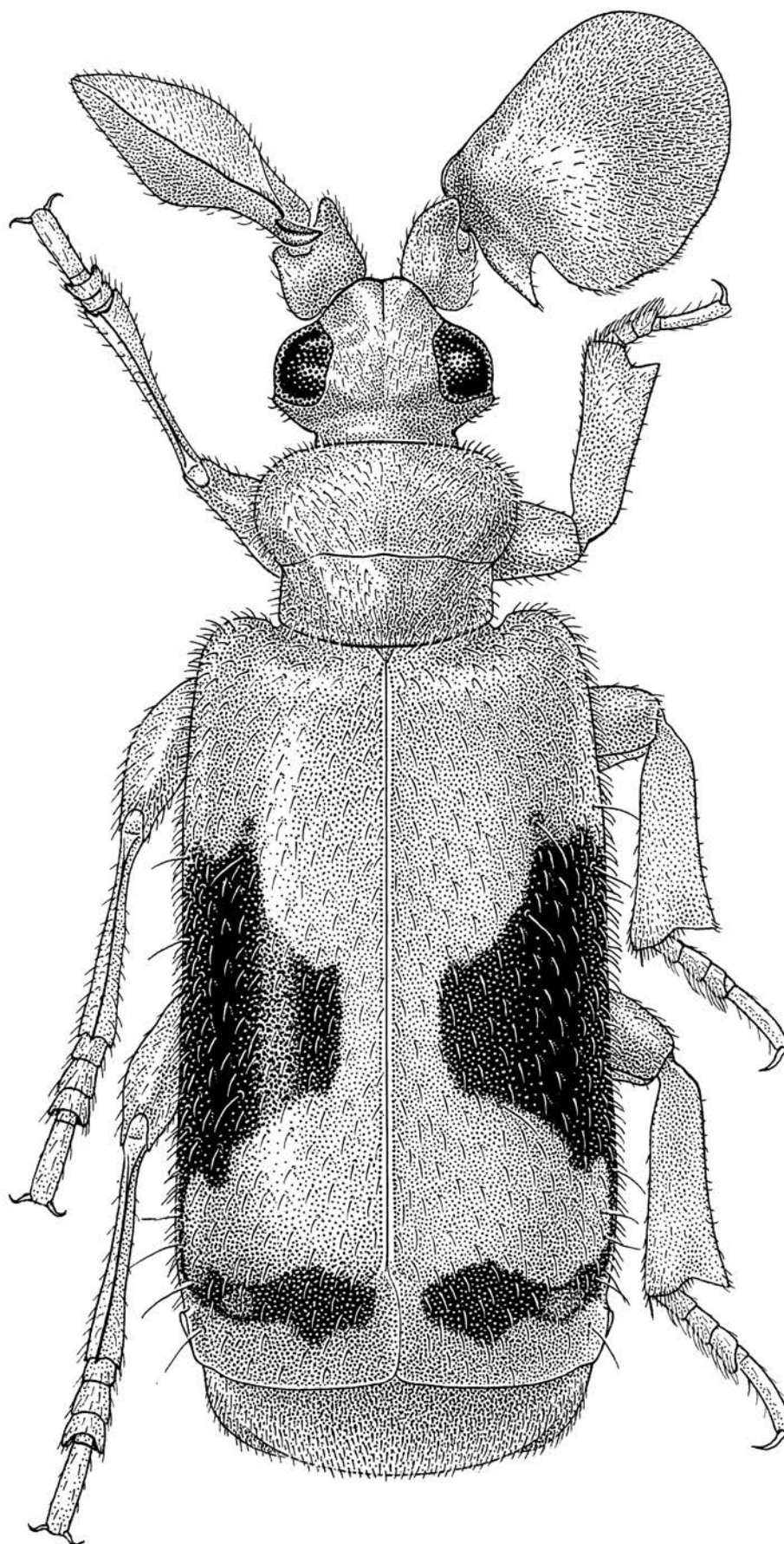


Fig. 8: *Platyrhopalus acutidens* Westwood. "[Pakistan], Indus River, Ketī Shah Bela, II.1969, leg. Pilleri" (BGUB). Scale bar: 1 mm. NB: The transverse dark marking near the elytral apex is also visible at the specimen from Nepal, Banepa, see JANETSCHEK (1990: p.88, Fig.33). In other specimens this marking is very weak or absent. Illustration E. Weber.

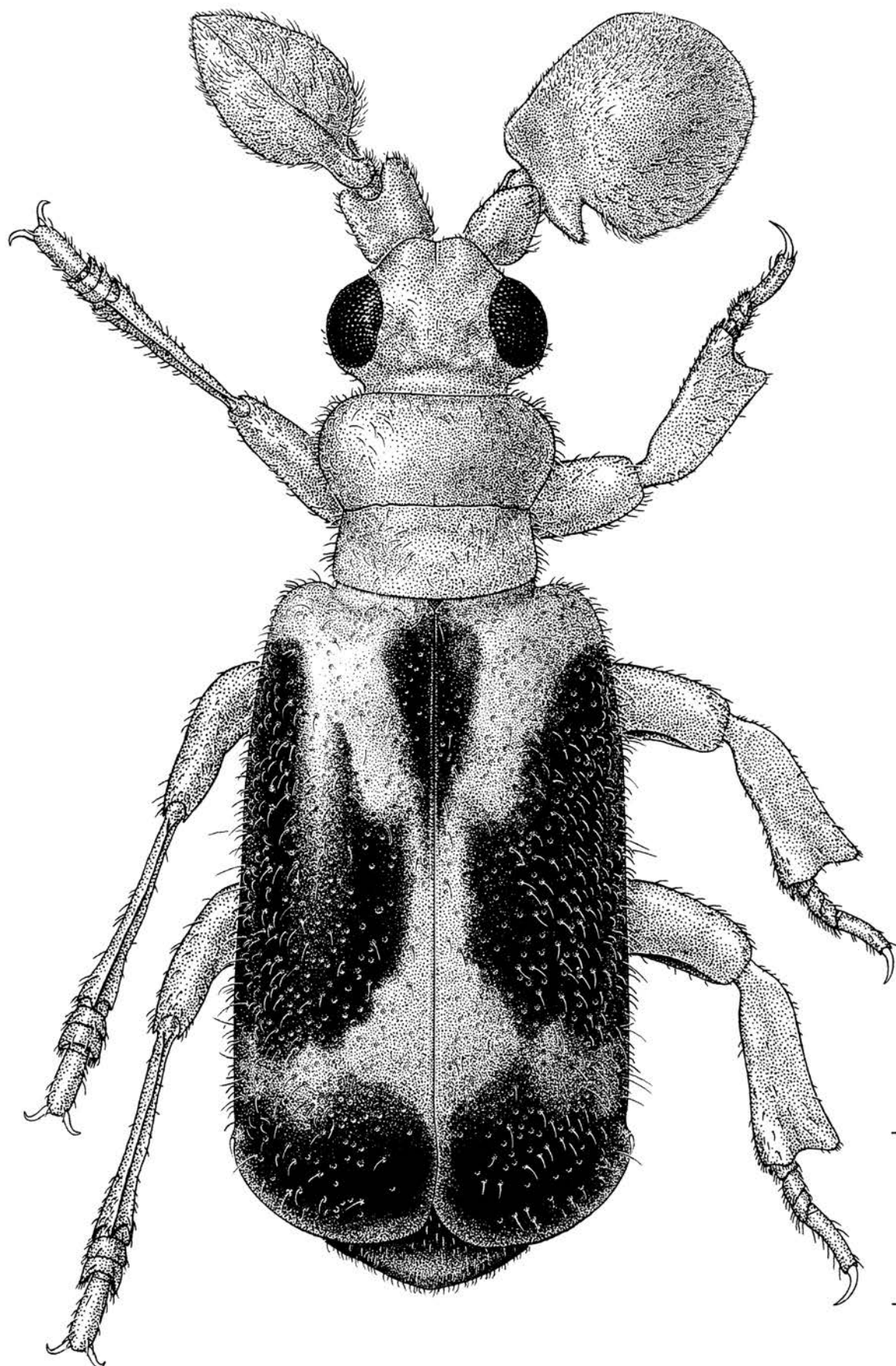


Fig. 9: *Platyrrhopalus paussoides* Wasmann. “British Bootang [= India, Darjiling (see HUBER & BAUR 2016)], L. Durel, 1898; R. Oberthür; *Plat. paussoides*, det. Wasmann” (TMP). Scale bar: 1 mm. Same locality as type series, perhaps part of it. Illustration A. Gertsch.

***Platyrhopalus paussoides* Wasmann, 1904 (Fig. 9)**

Platyrhopalus paussoides Wasmann, 1904 [31 Oct]: 20 (20-21, pl.3 fig.3)

Type locality: “Maria Basti, British Bootang, L.Durel, 1899”. India, West Bengal, Darjiling, Maria Basti parish near Pedong, northwestern Darjiling, leg. Léon Durel, 1899 (see HUBER & BAUR 2016).

Note: The elytral colour pattern is variable in size and intensity of the dark areas.

Host ant: Unknown.

General distribution: NEPAL (see below). INDIA (Uttarakhand, Darjiling, Sikkim, Assam). CHINA: many provinces, see NAGEL et al. (2017b), also Liaoning (LI 1992).

NEPAL: Published records: “Nepal, rive droite de la Darondi Kola, à 2000 m, sous des pierres” (LASSALLE 1982). “Nepal” (NAGEL 2003b). “Nepal, Karnali” (CHAUDHARY 2005). “Mid-Western Nepal, western Terai, Royal Bardia National Park, Thakurdwara, 4-24 July 1999, leg. Shrestha et al.” (SHRESTHA et al. 2001, p.46). NB: Possibly wrong identification because one mutilated specimen (head, antennal club, some legs, elytra still present) of *Platyrhopalus acutidens*, P.Nagel det. 2008, at NHMK is labelled “Royal Bardia National Park, VII-1999, P.K.Shrestha”.

Material examined: 1 ex. NMB: “Trisuli, 20.VI., 570-1200m, Nepal, 1978, Bhakta B.”.

Additional material examined: INDIA, Darjiling: 1 ex., NMB: “Sakyong, 1140m, 25.IX.1981. Darjiling Distr., India, Bhakta B.”. 1 ex., MTD: “British Bootan, Durel” (MTD). 1 ex.: “British Bootang, Maria Basti”. 1 ex., TMP: “British Bootang, I.Durel, 1898 R.Oberthür”. ? ex., MNHN, Kaupp i.l. ca 2001: “Brit. Bootan, Padong “. ? ex., MNHN, Kaupp i.l. ca 2001: “Brit. Bootan, Padong, Durel 1913/14 “. 1 ex., MNHN: „British Bootang, Maria Basti, 1899 / Museum Paris, 1952, Coll. R.Oberthür”. ? ex., MNHN, Kaupp i.l. ca 2001: “Inde, Sikim”. ? ex., MNHN, Kaupp i.l. ca 2001: “Inde Anglaise, Pedong, Région de Darjeeling”.

***Ceratoderina* Darlington, 1950**

***Ceratoderus* Westwood, 1841**

Ceratoderus Westwood, 1841a (12 June): 112

Type species: *Pausus bifasciatus* Kollar, 1836: 336 (336, plate XXXI figs.7a,b) (by original monotypy)

Included species: Ten species as follows: *Ceratoderus bifasciatus* (Kollar, 1836); *Ceratoderus oberthuerii* Gestro, 1901; *Ceratoderus tonkinensis* Wasmann, 1921; *Ceratoderus palpalis* Reichensperger, 1935; *Ceratoderus klapperichi* Reichensperger, 1954; *Ceratoderus venustus* Hisamatsu, 1963; *Ceratoderus jendeki* Maruyama, 2014, *Ceratoderus kentaro* Maruyama, 2014; *Ceratoderus yunnanensis* Maruyama, 2014; *Ceratoderus akikoe* Maruyama, 2014.

Host ant: *Ceratoderus venustus* was reported from nests of *Crematogaster vagula* Wheeler, 1928 (Myrmicinae, Crematogastrini) (cf. MARUYAMA et al. 2013).

Geographic distribution: Indomalaya including southern China and transition area to Palaearctic Region from Afghanistan through Pakistan, northwestern India and Nepal as well as southern Japan. The S.E.Asian Islands have records of the genus only from Java and the Philippines.

Identification: LUNA DE CARVALHO (1989), MARUYAMA (2014).

***Ceratoderus bifasciatus* (Kollar, 1836) (Fig. 10)**

Pausus bifasciatus Kollar, 1836 (7 Oct): 336 (336, plate XXXI figs.7a,b)

Type locality: “India orientali”, submitted by “Dom. Fichtel”. Leopold von Fichtel sold a collection of insects from “Ost-indien” (probably Indian subcontinent) to the Vienna Natural History Museum in 1804.

Holotype repository: NHMW

Host ant: Unknown.

General distribution: PAKISTAN (Sindh). NEPAL (see below). INDIA (Kashmir, Uttarakhand, Uttar Pradesh, West Bengal, Bihar, Haryana, Madhya Pradesh, Kerala, Tamil Nadu). BANGLADESH. THAILAND (“Siam”, Jeannel 1955: 185-186, which seems to be a confirmation of Tertrin's 1896 record).

The following records are doubtful assignments to *Ceratoderus bifasciatus* because the authors did not yet consider *Ceratoderus tonkinensis* Wasmann, 1921 or another, at that time still undescribed species:

MYANMAR (“Burma, Pyongchaun Res., North Toungou”, RIBEIRO 1930); CAMBODIA (“Cambodge, Battambang”, VITALIS DE SALVAZA 1919).

Note: It is with reservation that I assign the specimens mentioned below to *Ceratoderus bifasciatus* Kollar. The descriptions and illustrations of the specimens available to KOLLAR (1836: 336, plate XXXI, figs. 7a,b) and WESTWOOD (1843: 37-38, plate 58, figs.1a-d), appear to be different, which is most probably not exclusively due to the low efficiency of microscopes at that time (posterior basal angle of antennal club absent in Kollar's illustration, present in Westwood's illustration; in addition, the shape of the pronotum and the colouration of the apical part of the antennal club are different in both specimens). MARUYAMA's (2014) description and illustration of *Ceratoderus bifasciatus* also differ from the specimen here illustrated in Fig. 10 (outline and posterior basal angle of antennal club, intensity of two impressions on dorsal head between eyes, shape of pronotum). A study and redescription of the holotype specimen and Westwood's specimen is needed in view of our current knowledge of the high diversity of *C.bifasciatus*-like taxa. Characters relevant for classification also comprise the small protuberances at the posterior apical margin of the antennal club and presence, form and size of the trichomes at both ends of the transverse pronotal furrow.

NEPAL: Published records: “Nepal” (NAGEL et al. 2017b).

Material examined (first detailed record, reference for NAGEL et al. 2017): 1 ex., NME: „Nepal, Prov. Mechi, 26°39'49"N, 87°36'56"E, Uralabari, 120m NN, 28.III.2003, leg. J.Weipert“.

Additional material examined: INDIA: 1 ex., ZFMK: “Pusa, Bengal, under ground, Coll. Reichensperger”.

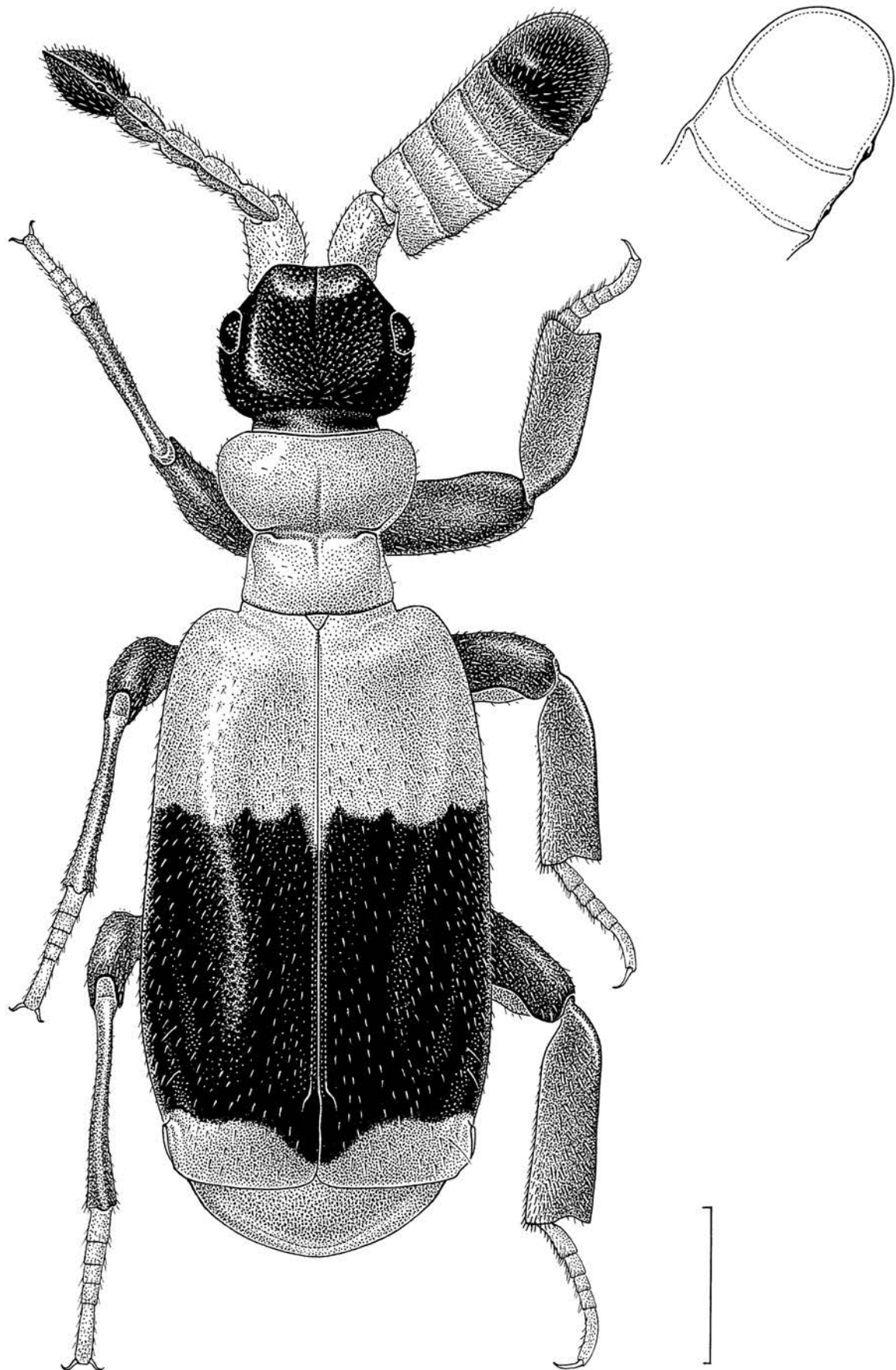


Fig. 10: *Ceratoderus* aff. *bifasciatus* (Kollar). "India, Pusa, Bengal" (ZFMK). Scale bar: 1 mm. The magnified section focuses on the protuberances at the apical hind margin of the antennal club. Illustration E. Weber.

Melanospilus* Westwood, 1847Melanospilus* Westwood, 1847 (1 Jan): 469Type species: *Melanospilus bensoni* Westwood, 1847 (1 Jan): 469 (by original monotypy).**Note:** See NAGEL et al. (2017a) for the complicated nomenclatural history of the synonyms of this genus and their type species.**Included species:** Six species as follows: *Melanospilus bensoni* Westwood, 1847; *Melanospilus hamaticornis* Van de Poll, 1890; *Melanospilus andrewesi* (Desneux, 1905); *Melanospilus borneensis* Reichensperger, 1938; *Melanospilus yamasakoi* Maruyama, 2009, *Melanospilus chitwanensis* sp. nov. (see below).**Host ants:** *Paratrechina longicornis* (Latreille, 1802) (Formicinae, Plagiolepidini) was reported as host ant of *Melanospilus bensoni* Westw. (cf. GEISELHARDT et al. 2007).**General distribution:** Scattered throughout the Indomalayan Region, including South China and Sunda islands. Extension into the Palearctic Region in Pakistan, Kashmir and Nepal (*Melanospilus chitwanensis* sp. nov. only, see below).**Identification:** LUNA DE CARVALHO (1989), MARUYAMA (2009).***Melanospilus chitwanensis* sp. nov.** (Fig. 11)

Holotype (here designated): ♂. Dry mounted, glued to pinned, pointed card. Right mid-tarsus and terminal fore-tarsomeres missing.

Locality label (white): "Nepal, Narayani / Sauraha Chitwan N.P. / offenes Grasland [open grassland] / Elefantengras-Ges. [elephant grass communities] / e. IV. 07 / leg. J.Küßner"

Additional label (white): "E.Weber del."

Red label: HOLOTYPUS / *Melanospilus chitwanensis* / P.Nagel, 2018

Holotype repository: Naturkundemuseum Erfurt, Germany (NME)

Diagnosis. Characterized within genus by colouration and unique formation of posterior basal angle of antennal club. Antennal club with posterior basal angle obliquely cut away, proximal pseudo-flagellomere a right-angled triangle with its broad end fully jointed to base of pseudo-flagellomere 2. In dorsal view head and antennae darkened, femora and tibiae black, tarsi dark ferruginous, elytra black with small light areas at base near suture and at apical angles.**Description.** Standardized body length (in dorsal view, frontal margin of head until hind margin of elytra): 4.3 mm, width across mid-elytra: 1.5 mm.

Body light flavo-ferruginous, including prothorax, with dorsal head and antennae darkened, femora proximally black, distal part and tibiae dark ferruginous, tarsi light ferruginous. Metasternum darkened. Abdomen inclusive of pygidium flavo-ferruginous. Elytra black with exception of a small area near scutellum and one ferruginous patch each at lateral apical angles.

Dorsal surface of posterior pronotum and pygidium smooth and shining. Head with distinct microsculpture and shallow punctuation, dull. Elytra with weak microsculpture and large, shallow punctures, each set with a seta. Elytral pubescence of evenly set, upright, light setae of middle length, with blunt

apex. Pronotum shining, posterior portion glabrous, without punctuation, anterior portion with scattered shallow, weakly demarkated punctuation, each bearing a short, adjacent, inconspicuous seta.

Head wider than long. Head dorsally with two shallow, confluent depressions between eyes. Dorsal surface rising from frontal margin to vertex behind eyes. Temples not projecting, contiguous with eyes.

Mouthparts: Labial palpomere I minute, II: as long as wide, increasing in width towards distal end, III: oval, longer yet hardly wider than II. Third from last maxillary palpomere moderately enlarged, in length subequal to both terminal ones together, and only little wider than terminal labial palpomere. Antennomere 1 long, narrow. Antennal club almost 3 times as long as wide, dorso-ventrally compressed with four transverse furrows and five dorsally and ventrally vaulted pseudo-flagellomeres. Pseudo-flagellomere 1 triangular, flagellomeres 2-4 rectangular, all of them twice as wide as long. Terminal flagellomere as long as wide, apically broadly rounded. Anterior apical and posterior margin of antennal club entire, hind margin weakly undulated. All four transverse furrows with small, yellow trichomes near their posterior end.

Pronotum as wide as long, fore portion little wider than hind portion, little narrower than head. Pronotum with deep transverse, trichome-bearing cleft, longitudinally channelled in the middle with groove ending before reaching anterior and posterior margins. The tubercles with a small tuft of setae are placed at the upper, outer edge of the hind declivity of the fore pronotum. Hind portion with anterior dorsal margin deeply emarginate at both sides behind the cleft.

Elytra parallel-sided, 1.7 times longer than wide, with a weak, broad, transverse impression just in front of middle. Shoulders rounded, not produced forwardly.

Pygidium smooth, glabrous, shining. Disk slightly vaulted, apical margin edged.

Legs long, narrow. Femora not sulcate underneath. Tibiae simple, not compressed, with oval diameter, without longitudinal ridges or channels. Hind tarsus with terminal tarsomere subequal in length to tarsomeres 2 to 4 together and distinctly longer than basal tarsomere.

Sex not determined.

Distribution: Only known from type locality in Nepal.

Type locality: Nepal, Terai, Narayani zone, Chitwan National Park near Sauraha town, elephant grass dominated vegetation, treeless.**Host ant:** Unknown.**Etymology:** The specific epithet is an adjective, derived from the type locality, Chitwan National Park, in Nepal.**Discussion:** The morphological peculiarities of the new species are best documented with the following amended key to species of *Melanospilus*:

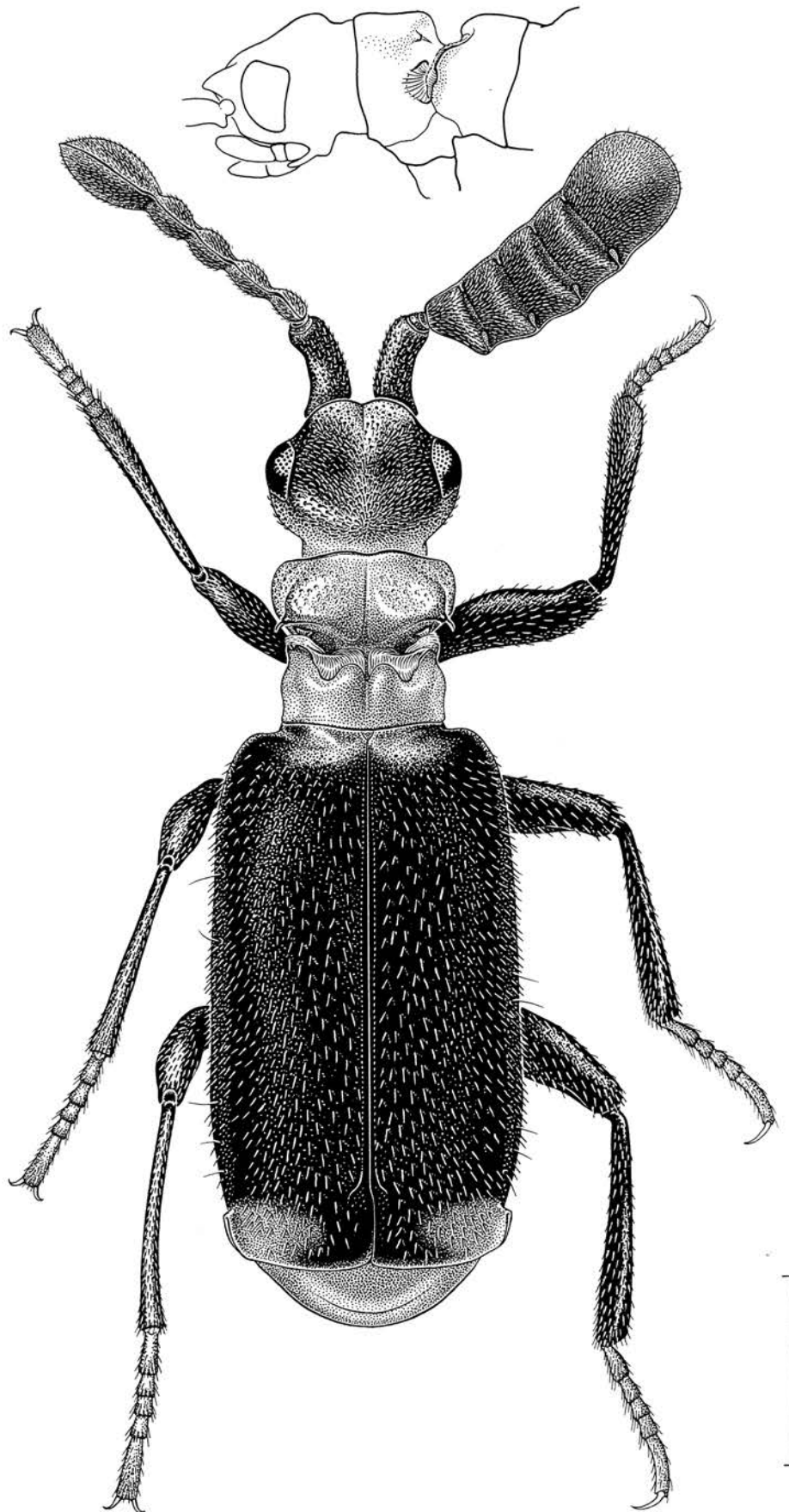


Fig. 11: *Melanospilus chitwanensis* **sp. nov.** Holotype specimen. Nepal (NME). The line drawing shows the pronotal trichome and the tufted tubercle at the upper part of the hind declivity of the fore part of the pronotum. Scale bar: 1 mm. Illustration E. Weber.

- 1 Antennal club at least 4 times as long as wide in the middle, with posterior basal angle produced into a thin, long, apically truncate process. Disk of pygidium with two large, approximate or confluent trichomal pads (sometimes obscured by apex of elytra). Elytra unicoloured flavo-ferruginous or with black markings (Sumatra, Borneo, Malay Peninsula).....
..... *M. hamaticornis*, *M. borneensis*, and undescribed species
- 1' Antennal club at most 3 times as long as wide in the middle, with posterior basal angle unarmed, with short, acute spinule or produced into a strong acute angle. Disc of pygidium without trichomal pad..... **2**
- 2 Proximal pseudo-flagellomere triangular, with hind margin obliquely cut away. Body flavo-ferruginous with head, antennae and legs darkened. Elytra black with extreme base near scutellum and apex laterally with light markings. Pygidium smooth and shining (Nepal)..... *M. chitwanensis* **sp. nov.**
- 2' Posterior basal angle of antennal club rounded, angular or spinulate. Head, antennae and legs flavo-ferruginous. Elytral black pattern not as above. Pygidium with special structures present or absent **3**
- 3 Dorsal surface matte, elytra with one large black, shining lateral marking behind middle and one smaller patch at the apical part of the suture. Proximal pseudo-flagellomere narrower than the joining ones. Disc of pygidium with low swelling running cross-wise, which is edged at its transverse lower (apical) margin (in resting position just covered by apical elytra) (India, Pakistan) *M. bensoni*
- 3' Elytral pattern not as above. Antennal club approximately of equal width from base to apex, not widened towards pseudo-flagellomeres 3 and 4. Pygidium without conspicuous structures **4**
- 4 Elytra black except base and apex (S-India, Sri Lanka) *M. andrewesi*
- 4' Elytra with conspicuous rounded black spots (Laos, China) *M. yamasakoi* and undescribed species

Paussina Latreille, 1806

***Paussus* Linnaeus, 1775**

Paussus Linnaeus, 1775 (18 Dec): 6 [6-7, pl. fig.6-10]

Type species: *Paussus microcephalus* Linnaeus, 1775 [18 Dec]: 6 (6-7, pl. fig.6-10) (by original monotypy, not by LATREILLE 1810 as indicated by LORENZ 2005a).

Subgenera: 48 potentially valid names for subgenera were listed by NAGEL (2003b), yet hardly any were unequivocally accepted by experts on the taxon. The most recent attempt to elaborate a phylogenetically based classification within the genus *Paussus* was given by ROBERTSON & MOORE (2016), and further nomenclatural implications were published by NAGEL et al. (2017a). To date, approximately half of the known species have been attributed to one of the 14 newly defined subgenera (named and unnamed), and the remainder are all classified as incertae sedis. A key to the identified and named subgenera was given by ROBERTSON & MOORE (2016). Its use requires dissection of at least mouthparts and gular region of head.

The subgenus assignment of *Paussus tibialis* and *Paussus cardoni* is taken from ROBERTSON & MOORE (2016). *Paussus hardwickii*, *Paussus schiodtii* and *Paussus yubaki* sp.nov. were studied by myself for the present publication.

Included species: ca 350 in total; Indomalayan Region: ca 100.

Geographic distribution: Southern Palearctic, Afrotropical, Madagascan, and Indomalayan Regions.

Identification of Indomalayan species: WASMANN (1904), FOWLER (1912), LUNA DE CARVALHO (1989), additions of new species by NAGEL (2009, 2016), NAGEL & BEDNAŘIK (2013), and MARUYAMA (2014, 2016).

***Paussus* (Subgenus incertae sedis*) *hardwickii* Hope, 1831** (Fig. 12)

Paussus hardwickii Hope, 1831 [5 Nov]: 27

Type locality: "Nepaul, in Coll. Major General Hardwicke".

Nepal, part of the collection of Thomas Hardwicke, see type locality of *Platyrhopalus acutidens* above.

Type repository: OUMNH (NHM also keeps a specimen of Hardwicke's bequest, with a round label bordered with red colour, and printed "Type", possibly the specimen from "Nepāl" listed by Anonymous 1839, p. 399).

***Note:** Classified as *Paussus* series I, incertae sedis by ROBERTSON & MOORE (2016). We studied some characters of the Assam specimen of *P. hardwickii* from NMB to obtain basic data for subgenus classification.

Mouthparts: The maxillae have palpomere II explanate along inner margin, widened at apex, distinctly angular at apical inner corner, and at this point 1.5 times wider than palpomere III. Length of maxillary palpomere II subequal to palpomeres III and IV combined. Terminal maxillary palpomere little shorter and at base somewhat narrower than palpomere III. Lacinia distinctly multisetose at anterior margin (character state 32.2 in ROBERTSON & MOORE 2016: Table S2). Labial palpomere III narrow, elongate, parallel-sided, very long, distinctly longer than I and II combined. Ligula with anterior margin bisinuate, lateral anterior angles produced anteriorly. Ligula with apical marginal area setose of irregularly set, elongate setae, the produced lateral angles with a cluster of few such setae. The outline of the ligula and the labial palpomeres are basically similar to Fig. 7N in ROBERTSON & MOORE (2016, p.142).

Gula: Width between tentorial pits / length ratio is 0.5 (Score 14.2 in ROBERTSON & MOORE 2016: S2). Width at narrowest point / length ratio is 0.3 (Score 15.2). Median gular suture long, extending backwards from level of tentorial pits (Score 13.2)

Flagellum: Without trace of excavation.

Pronotum: Transverse cleft in the shape of a well marked furrow. Prothoracic trichomes absent. Notopleural suture apparently absent.

Pygidium: Inconspicuously marginate at apical margin (= posterior dorsal margin), almost vestigial in the middle. Marginal setal band inconspicuous, short setae are set at wide distance.

Disc proximally with a trichome at both sides (Fig. 12).
Tibiae: with terminal spurs present.

The integration of this species into a phylogenetic analysis (ROBERTSON & MOORE 2016, Table S2, S3) is needed to decide upon the membership of a particular lineage.

Based on the key proposed in ROBERTSON & MOORE (2016: 27f), *Paussus hardwickii* keys out as member of the subgenus *Edaphopaussus* Kolbe, 1920 when accepting some of the less important contradictory character states compared to subgenera *Bohemanipaussus* Luna de Carvalho, 1982 and *Bathypaussus* Wasmann, 1929.

However, there is some probability that *P. hardwickii* is a member of the clade comprising *Paussus hearseyanus* Westwood, 1842 and allies as discussed by ROBERTSON & MOORE (2016, p.163). Possibly, this lineage would then be classified as subgenus *Transitupaussus* Kolbe, 1929 (type species: *Paussus hardwickii*).

Host ant: unknown.

General distribution: PAKISTAN (Swat / Khyber Pakhtunkhwa, Punjab). NEPAL (see below). INDIA (Kashmir, Himachal Pradesh, Uttarakhand, Assam). MYANMAR.

NEPAL: Published records: “Nepal” (HOPE 1831, 3 ex. see WESTWOOD 1833: 650). “Nepal. Près de Nagarkot, à 2000 m (Est de Kathmandou), trois exemplaires attirés par la lumière ou par des pièges” (LASSALLE 1982). “Nepal, Weg von Thöse nach Jiri, 1800-2000m, 14.VI.1961, Handsammlung, leg. Janetschek, det. Ed.Luna de Carvalho 1969” (JANETSCHKE 1990, cf. Thapa 2015: 543).

Material examined: 1 ♀, Coll. Wrase: “Nepal, betw. Pokhara and Lumle (Kare-La) pass, 860-1700m, 11.XI.1977, J.Frank, Coll.Wrase, Berlin”. ? ex., MNHN, Kaupp i.l. 2001: “Nepaul”.

Additional material examined: INDIA. 1 ♂, NMB(Frey): “Assam, Kaziranga / Nördl. Mikir-Hills / Brahmaputra, V. / 1961, leg. G.Scherer // *Paussus hardwickii* Westw. / Det. G.Frey 196_”. 1 ex., OUMNH: “Ostindien / Coll. Sallé” NHMM. 1 ex.: E.India / Captⁿ Mortimer Slater // W [rhombic label = “Westwood”] // *Paussus hardwickii* Westw.”. ? ex., MNHN, Kaupp i.l. ca 2001: „Goorais Valley, Kashmir, 7000 feet, VI.1987“. ? ex., MNHN, Kaupp i.l. ca 2001: „Punjab“. ? ex., MNHN, Kaupp i.l. ca 2001: „Mussoorie [Uttarakhand]“. ? ex., MNHN, Kaupp i.l. ca 2001: “Kulu dist. [Himachal Pradesh]”. ? ex., MNHN, Kaupp i.l. ca 2001: “Simla VII.96 [Himachal Pradesh]”.

Paussus (Scaphipaussus) tibialis* Westwood, 1841

Paussus tibialis Westwood, 1841a [12 June]: 111

Type locality: “Bengalâ”. Back then around 1840 “Bengal” comprised mainly the Lower Gangetic and Brahmaputra plains, including today's Bangladesh.

Type repository: ZMUC

***Note:** Assigned to subgenus *Scaphipaussus* by ROBERTSON & MOORE (2016).

Host ant: *Pheidole* sp. (Myrmicinae) (see below).

General distribution: NEPAL (see below). PAKISTAN (Swat, see below). INDIA (“Bengal” [WESTWOOD 1841a]; Bihar [RIBEIRO 1930]; Himalayan districts of the north-western provinces of India [including today's Pakistan] [ATKINSON 1884]).

NEPAL: Published records: “Nepal” (NAGEL 2006, NAGEL et al. 2017b).

Material examined (first detailed record): 1 ex., BGUB: “E-Nepal, Arun Valley, Sultibari, 500m, 11.14.VI.1988, leg. Lebisich & Probst”.

Additional material examined: PAKISTAN: 1 ♂, NMB (reference for record in NAGEL 2003b, 2006): “Murgzar 5000’ [approximately 1225 m], Swat, 20.VI. / Pakistan, 1974, C. Baroni Urbani [with *Pheidole* spec., major worker]”.

Paussus (Scaphipaussus) schiodtii* Westwood, 1874

(Fig. 13)

Paussus schiodtii Westwood, 1874 [31 March]: 85 (85, pl. XVI fig.6)

Type locality: “Bengal (Bowring)”.

Type repository: NHM

***Note (new subgenus classification):** This species was classified as *Paussus* series I, *incertae sedis*, in Robertson & Moore (2016) by mistake (Robertson i.l. 2018). Westwood (1874) illustrates the species with clearly visible terminal spurs at the hind tibiae in Fig.6, pl.16. The subgenus is now corrected to *Scaphipaussus* (*Paussus* series II) based on the following results.

I identified the specimen from Nepal (see below, and Fig. 13) as *Paussus schiodtii* Westwood despite a few differences to WESTWOOD's (1874) description and figure. The specimen in hand is a female, and it has the tibiae more dilated. The terminal tibial spurs are absent and the pronotum is slightly more elongate. It also has trichomes in the transverse pronotal furrow. The differences in the shape of the tibiae could be the result of sexual dimorphism or of an oblique view in Westwood's figure 6. Trichomes are often darkened and soiled and might have been easily overlooked by Westwood (1874) and Fowler (1912).

The standardized body length is 6 mm. The key provided by ROBERTSON & MOORE (2016) leads to subgenus *Scaphipaussus* Fowler, 1912 without complications. Apical tibial spurs are absent or at least indistinguishable from the setae of the terminal setal band. This character state in all probability excludes the classification as *Paussus* series I.

According to our knowledge, this specimen is the second specimen ever reported.

Host ant: unknown.

General distribution: NEPAL. INDIA (“Bengal” [WESTWOOD 1874]).

NEPAL: Published records: “Nepal” (NAGEL 2004: 21).

Material examined (first detailed record, reference for record in NAGEL 2004): 1 ♀, BGUB: „E-Nepal, Arun Valley, Khandbari – Bhotepas, 1000-1750 m, 5.VI.1988, leg. Lebisich & Probst”.

Additional material examined: INDIA: Holotype specimen, NHM: “Typus // *Paussus gerstaeckeri* Westw. // *Paussus schiodtii* / (Type) Westw. // Bengalen” (I studied this specimen a few years ago and noted “tibiae compressed”, yet did not take a note on the pronotal trichomes).

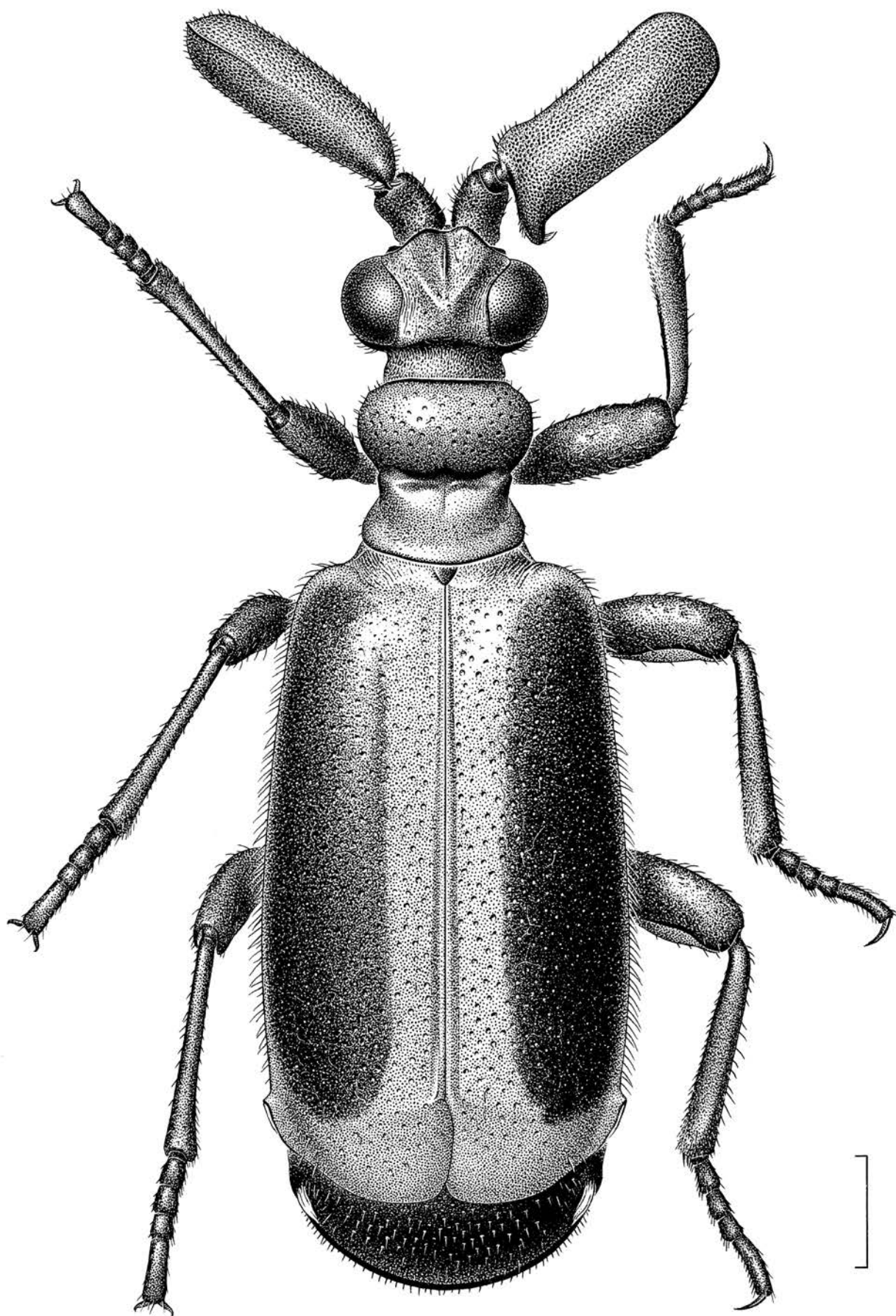


Fig. 12: *Paussus hardwickii* Hope. "[India] Assam, Kaziranga, Nördl. Mikir-Hills, Brahmaputra Valley, 1961, leg. G.Scherer" [NMB(Frey)]. The pygidium is artificially shown in a slightly protruding position to make the lateral trichomal tufts visible. Scale bar: 1 mm. Illustration A.Coray.

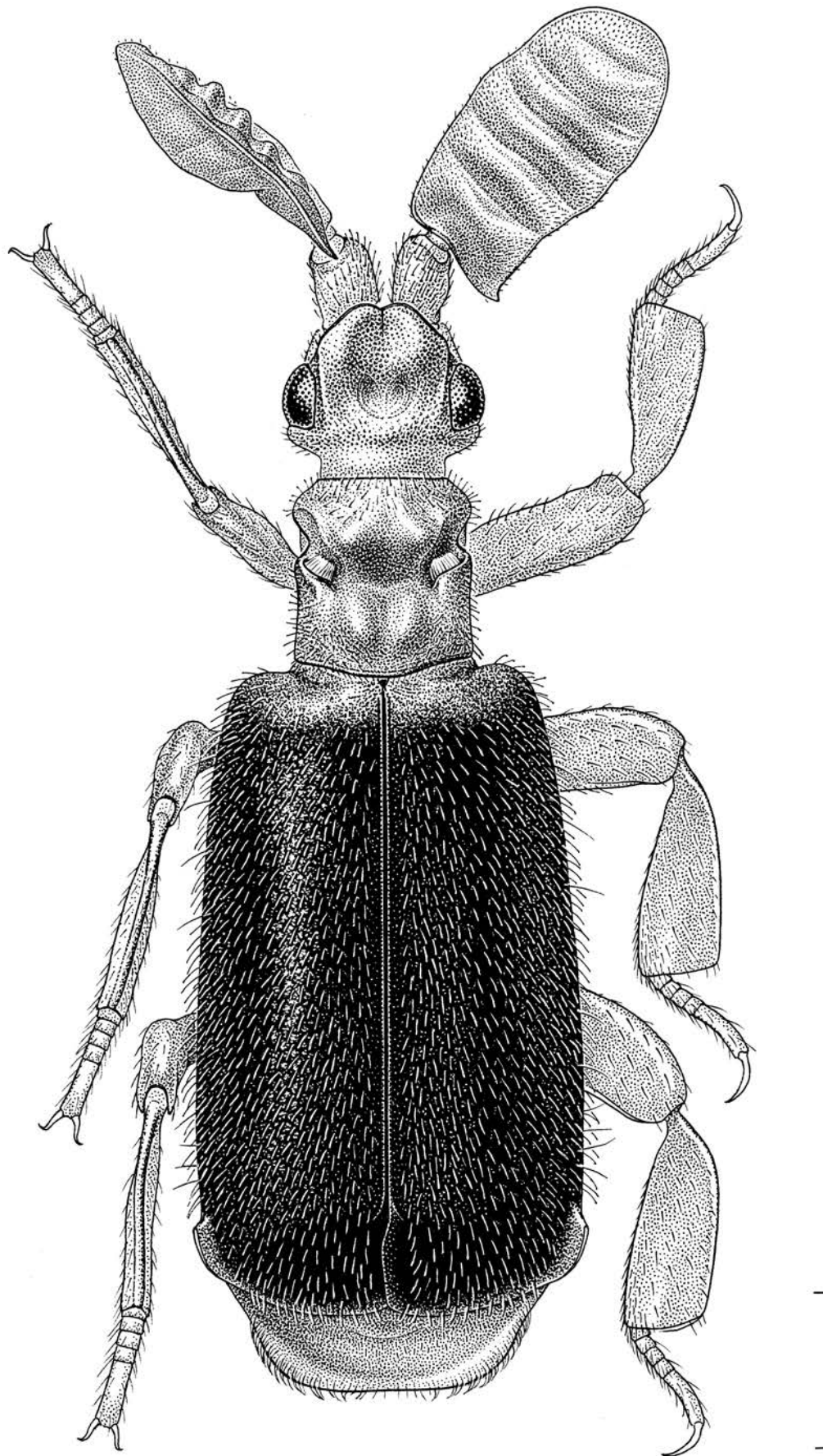


Fig. 13: *Paussus schiodtii* Westwood. ♀. "E-Nepal, Arun Valley, Khandbari-Bhotebas, 1000-1750 m, 5.VI.1988, leg. Lebisich & Probst" (BGUB). Scale bar: 1 mm. Illustration E. Weber.

***Paussus (Scaphipausus) cardoni* Wasmann, 1904**

Paussus cardoni Wasmann, 1904 [Oct 1904]: 57 (47, 57-58, pl.V fig.6)

Type locality: “Bengalen, Chota-Nagpore, Nowatoli und Barway, Juni 1897, leg. R.P.Cardon, S.J.”. Mission stations and parishes Nowatoli (Konbir Noatoli), Chotanagpur, Jharkhand, and Barway, probably nr. Chainpur, Chotanagpur, Bihar, leg. P.Cardon. LUNA DE CARVALHO (1989) cites “Nowatoli” as type locality.

Type repository: RMNH

Note: Assigned to subgenus *Scaphipausus* Fowler, 1912 by ROBERTSON & MOORE (2016). This species is unknown to me in natura.

Host ant: *Pheidole latinoda* Roger, 1863 (Myrmicinae, Pheidolini) (WASMANN 1904).

General distribution: NEPAL. INDIA (Jharkhand, Bihar) (WASMANN 1904).

NEPAL: Published record: “Nepal, deux exemplaires sous une pierre sur la rive droite de la Darondi Kola, à 2000 m, dans un nid de Fourmis de la tribu des Pheidolini” (LASSALLE 1982). This record was overlooked by NAGEL (2003b), CHAUDHARY (2005) and NAGEL et al. (2017b).

***Paussus (Paussus*) yubaki* sp. nov. (Figs. 14, 14a)**

Holotype (here designated): ♀, dry, good general condition, complete, right hind leg detached from metasternum, glued to pinned card.

Original labels: O-Nepal 1980, W.Wittmer [printed, white rectangular label]; Tumlingtar-Khandbari, 400-900m, 21.5. [printed, white rectangular label]; *Paussus* sp. n., aff. *schaumi/spencei*-Gruppe, Nagel det. 1995 [printed, white rectangular label];

Labels added during this study: ♀ [printed, white rectangular, small label]; HOLOTYPE, *Paussus yubaki*, P. Nagel, 2018 [red, rectangular label]

Holotype repository : Natural History Museum Basel, Switzerland (NMB).

Material examined: Holotype specimen, the only specimen known.

Diagnosis: Unmistakable by the formation of the antennal club and the head ornamentation; the antennal club is a longitudinal, laminiform rectangle with broadly rounded apex; it is thin and flat except the bulging at the middle of the hind margin, caused by a longitudinal excavation; head dorsally with two oblique, narrowly beanshaped furrows, bordered by upright lamellae; vertex with transverse, bisinuate, upright lamella; each elytron with 3 rounded, large spots, demarcated by shallow depressions or different microsculpture;

Description: Standardized body length 6.3 mm, elytral width 2.1 mm;

Colour: Body, head and pronotum rufo-castaneous, appendages and abdomen with pygidium flavo-ferruginous, ventral head, prothorax, mesosternum, and metasternum as well as elytra darkened;

Pubescence of mostly inconspicuous, short, thin, upright or slanting hair; eyes and pronotal excavation glabrous.

Surface structure: Head, pronotum, pygidium and, most prominently, elytra with microreticulation or explanate microgra-

nulation; elytra additionally with weak and sparse rugosity, resulting in a matt, leathery appearance; head strongly rugose and wrinkled, dull in contrast to the weakly shining pronotum, elytra and pygidium; pronotum wrinkled with the exception of the depressions and the smooth areas posterior to the trichomes; antennal club smooth and shining, with scattered large, shallow punctures.

Head slightly longer than wide (1.1 times); relief of vertex of sharply marked lamellae and narrow, excavated furrows; the beanshaped oblique furrows are closed at both ends and end up in a gland opening at their proximal ends; head surface with a deep depression between the frontal end of the furrows; proximal upright lamella bisinuate; frontal plates sharply edged only at the frontal margins and apical corners, with lateral margins rounded and edges obliterated in the coarse rugosity; frontal plates apically markedly inclined towards the midline only at their most distal part; each one 2.5 times longer than broad; pair of frontal plates together 1.3 times longer than wide; eye 1.6 times longer than gena; when seen from above, temples not projecting beyond eyes, straightly converging towards the neck constriction;

Mouthparts: Maxillary palpomere II expanded, 1.2 times longer than wide at apex, inner apical angle broadly lobed; mesal (inner) margin slightly concave, explanate, thin and almost transparent in the middle, being suggestive of a deeper, crescent-shaped emargination. Maxillary palpomere II longest and widest; palpomere III smaller yet also large and distinctly wider than following palpomere; terminal maxillary palpomere IV much smaller, forming a short, apically broadly rounded cone.

Terminal labial palpomere flattened, spade-shaped, two times as long as wide; articulation between labial palpomeres II and III shifted to the outer margin of palpomere II.

Ligula with apical median margin narrowly rounded.

Antenna: Antennomere 1 (scape) apico-laterally with a short linear tuft of hair, which is a reduced form of the larger, cushion-like subapical trichome of allied species;

Antennal club a longitudinal, laminiform rectangle with slightly dilated and broadly rounded apex; it is thin and flat except the bulging at the middle of the hind margin, caused by the elongate excavation of the hind margin; lower margin of excavation entire, slightly and irregularly undulate, without denticles; upper margin with 3 distinct, longitudinal gibbositities underneath, not visible from above; a 4th almost obliterated gibbosity at the distal end; bottom of excavation glabrous, matt of dense microsculpture; basal posterior margin of antennal club next to the insertion apparently with small round perforation; only at close inspection one realizes that the basal margin is not entire but notched at this point;

Pronotum as wide as long, with fore and hind part of almost equal width; fore and hind part of equal length, separated by transverse cleft, and equipped at both sides with one transversely split golden trichome each; fore part 1.3 times wider than head; fore part broadly rounded dorsally and laterally, with median longitudinal furrow not reaching the anterior margin; distance between the trichomes 1.2 times longer than the width of each trichome; basis of pronotum laterally constricted, resulting in slightly cordiform shape of hind pronotum;

Elytra sparsely hairy of thin, upright setae, about as long as the setae of the series umbilicata; each elytron with 3 patches of particular microstructure one behind another; the two frontal

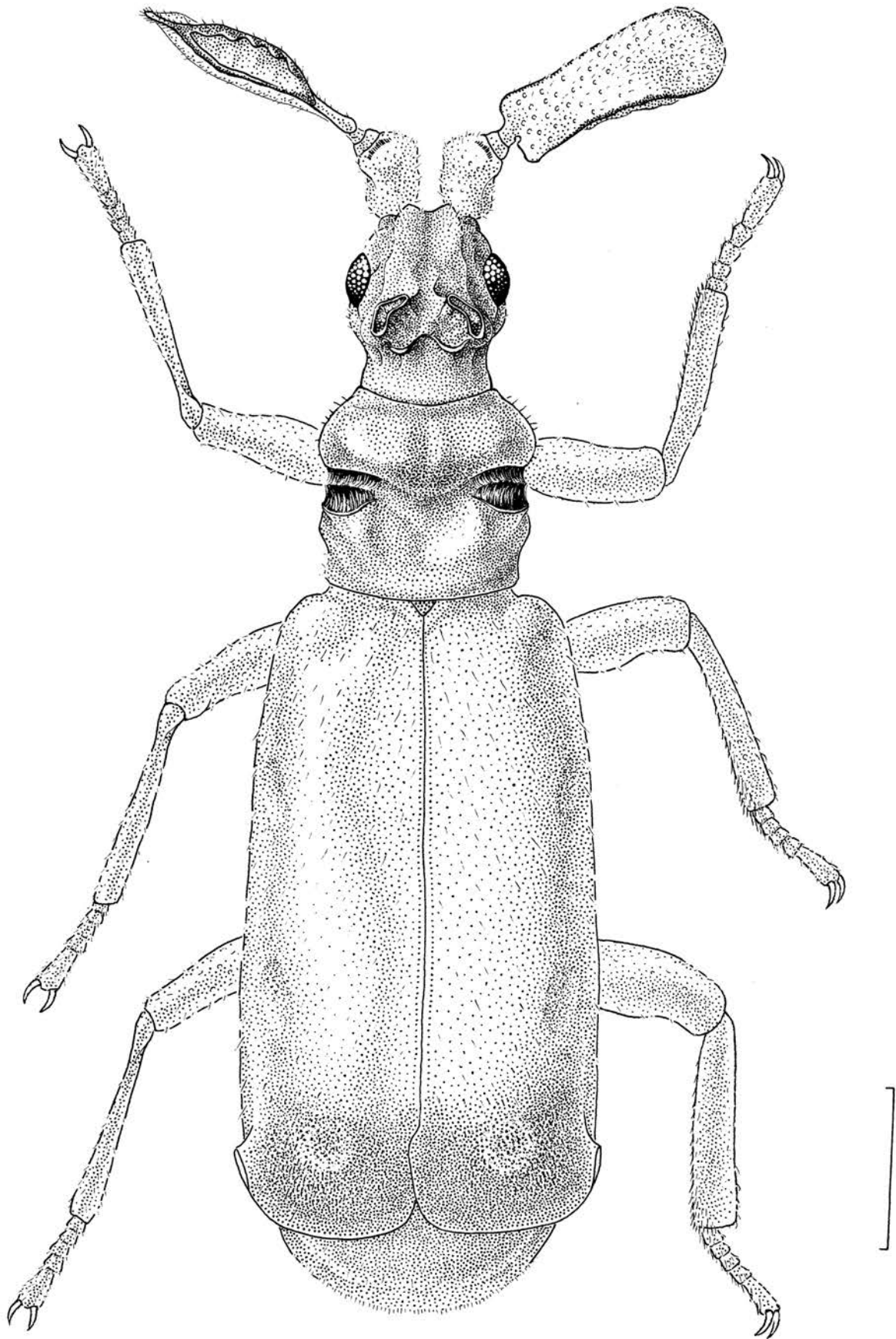


Fig. 14: *Paussus yubaki* **sp. nov.** Holotype specimen. Nepal (NMB). Scale bar: 1 mm. Illustration S.Flachsmann and E.Weber.

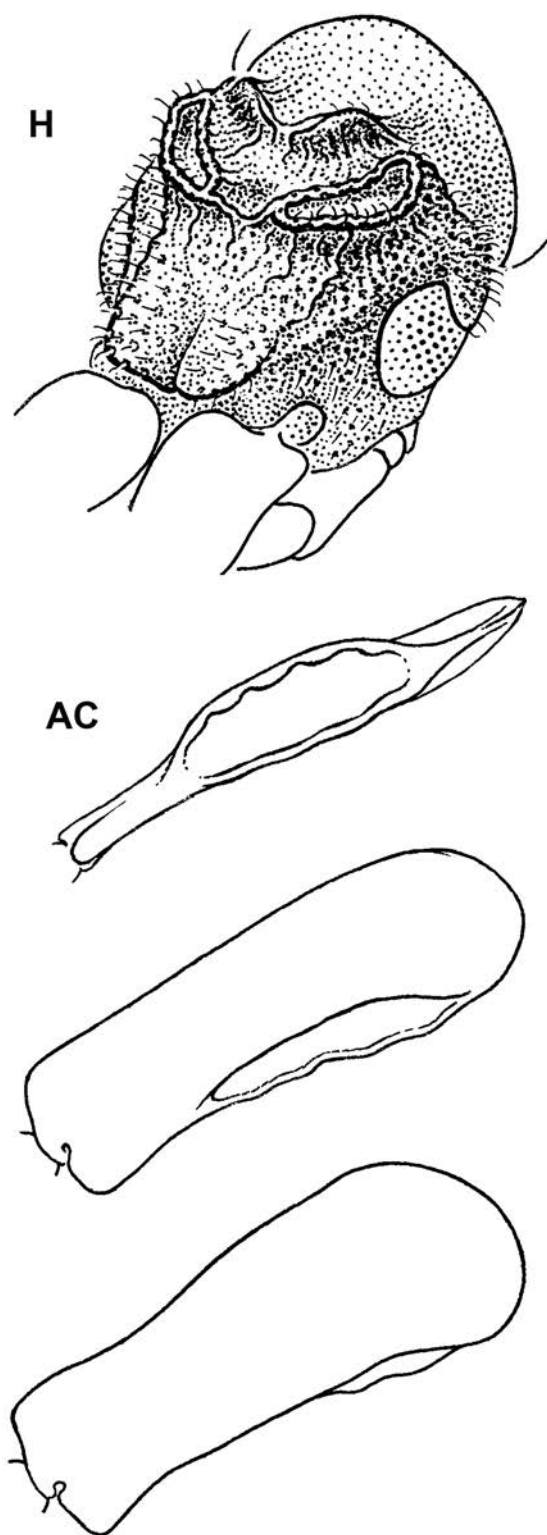


Fig.14a: *Paussus yubaki* sp. nov. Holotype specimen. Nepal (NMB). H: Head in oblique fronto-dorsal view. AC: Right antennal club; top: posterior view; middle: dorsal view, slightly rotated through longitudinal axis; bottom: plain dorsal view. Illustration E.Weber.

patches slightly depressed and located more laterally, the rear 3rd patch rounded and level with surface;

Hindwings present;

Pygidium with trichome absent; apical, semicircular margin with low and fine carina, bordered by a single row of short bristles; disc with one median, longitudinal, shallow depression and one longitudinal, short swelling close to the margin at each side of the central depression; disc matt of microsculpture, set with scattered punctures and associated setae;

Legs long and slender, tibiae compressed; femora, tibiae and dorsal tarsi with sparse and inconspicuous punctuation, each puncture with a weakly squamiform seta; tarsi underneath with sparse, simple bristles; terminal tibial spurs absent.

Gonocoxae: projecting, diverging tips of normal shape of *Paussus* s.l.;

Distribution : East Nepal, known from the type locality only.

Host ant: unknown.

Type locality: Nepal, Eastern Region, eastern slopes of central Arun Valley, between Tumlingtar [27°18'47"N 87°11'58"E] and Khandbari [27°22'38"N 87°12'30"E]; Tumlingtar is located at the bottom of the valley at 400m alt., Khandbari on top of the valley slope at about 6km straight distance North of Tumlingtar; sampling date 21 May 1980; collector Walter Wittmer (1915-1998), former head of Entomology Department of NMB, an expert on Malacodermata, mainly Cantharidae and Malachiidae who undertook collecting expeditions to many parts of the world; the travel to the Arun Valley in 1980 was undertaken together with Horst and Ulrike Aspöck, Hubert Rausch and Carolus Holzschuh (BRANCUCCI 2005); the travel records available at the NMB confirm the data of the locality labels yet reveal no additional information [selected locality: 27°20'51"N 87°11'55"E].

Etymology: The species is named for Dr. Yubak Dhoj G.C., Secretary of the Government of Nepal, Ministry of Forests and Soil Conservation, Kathmandu. I fondly remember our time together in Basel and in the field in Nepal and I am pleased to learn that entomological and conservation issues are still relevant to his professional activities.

***Discussion of relationships:** Despite a different formation of the mesal margin of maxillary palpomere III (see description above), the criteria described by ROBERTSON & MOORE (2016) allow the assignment of this new species to the nominate subgenus of *Paussus*. Future studies will have to consider these traits in order to further elaborate the phylogenetic relationships within the subgenus.

We currently assign this new species to the *P. jousselinii* group which is supported by a combination of characters such as the basic structure of the head relief, the rounded elytral markings and the scape having an anterolateral trichomal brush. This species group also includes a few afrotropical species such as *P.wittei* Reichenberger, 1950, *P.africanus* Luna de Carvalho, 1958 and perhaps also *P.curtisii* Westwood, 1864. The shape of the antennal club of the new species, however, is unique within the group. A small excavation of the hind margin of the antennal club is also present in *P.spencii* Westwood, 1864.

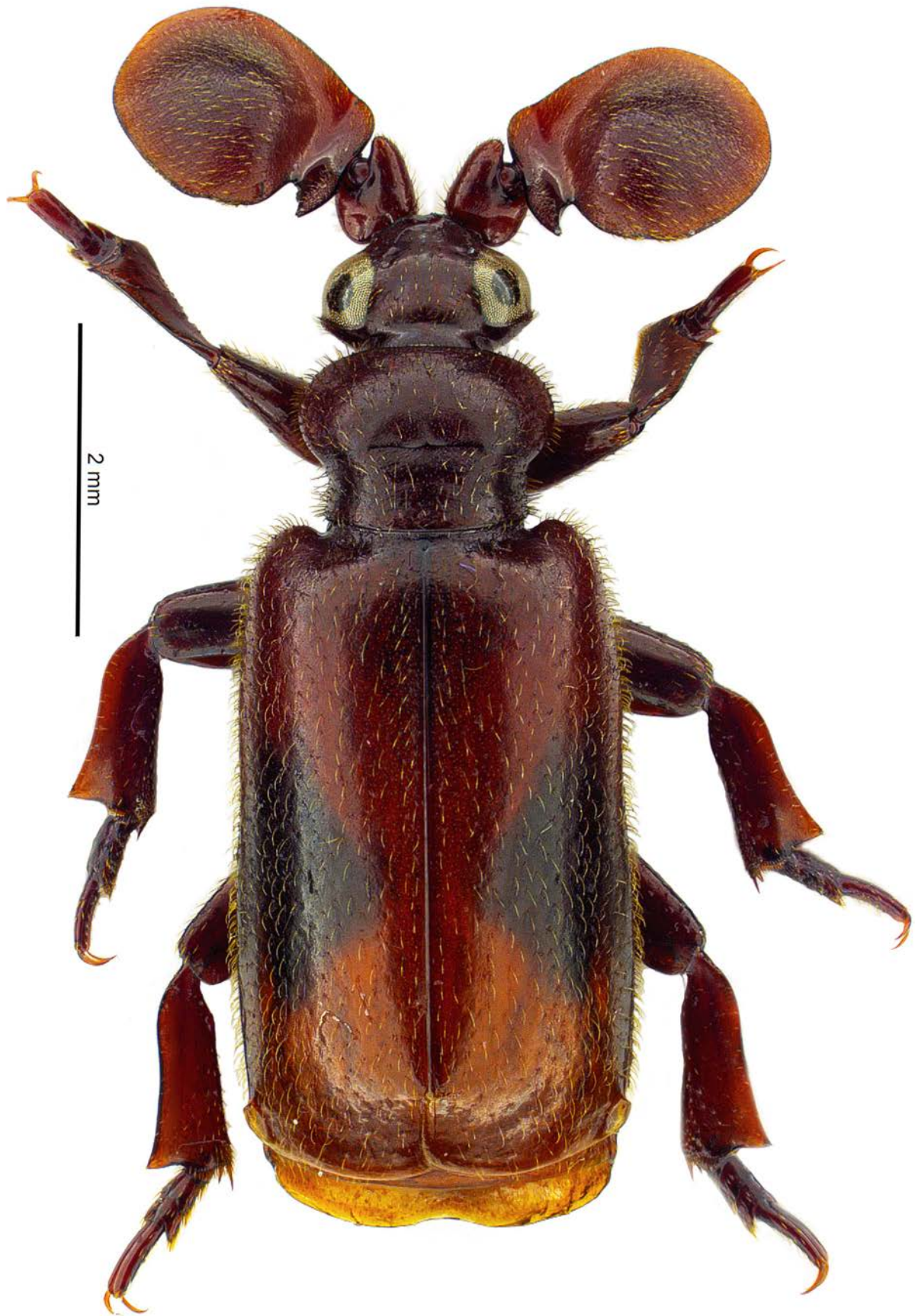


Plate A: *Platyrhopalus acutidens*, Nepal, Chitwan district, Sauraha, Rapti River, near Hotel Riverside, 26.VI.-02.VII.2011, leg. J.Küßner, coll. NME. Photograph: J. Schmidt.

Discussion

The southern slopes of the Himalaya have a pronounced relative relief. They harbour, at small distances from each other, both Palaearctic and Indomalayan (Oriental) faunal elements with temperate / montane, subtropical and tropical ecological preferences. Authors classify this narrow strip (at a global scale) as either part of the Palaearctic Region (such as KRYZHANOVSKY 2002 [insects]) or as a westward extension of the Indochinese subregion of the Indomalayan Region (such as WALLACE 1876 [vertebrates], HOLDHAUS 1927-1928 [insects], FRANZ 1970 [insects], MANI 1974 [general]), or as a subregion of its own within the Indomalayan Region (CORBET & HILL 1992, mammals) (cf. MACKINNON & MACKINNON 1986, MACKINNON 1997).

All Nepalese Paussinae are Indomalayan faunal elements, irrespective of several expansions into areas normally classified as Palaearctic. As with many other invertebrate taxa (cf. MARTENS 2015) we do not yet have sufficient data to assign with certainty each Nepalese Paussinae species to a particular faunal element, also because we cannot yet assess their real distribution. Possibly, the following assignments might be accurate. *Cerapterus quadrimaculatus*: a widespread Indomalayan element, *Platyrhopalus acutidens*: an Indian faunal element, *Ceratoderus bifasciatus*: an Indochinese faunal element, *Paussus hardwickii* and *Paussus tibialis*: Himalayan faunal elements. The general scarcity of locality records does not yet allow the recognition of “endemic” taxa. Currently, *Protopaussus vignai* sp. nov., *Melanospilus chitwanensis* sp. nov. and *Paussus yubaki* sp. nov. are only known from their type locality in Nepal.

Exclusively Palaearctic Paussinae are rare and restricted to the Mediterranean Region and to the Arabian Peninsula. An exception is the Palaearctic *Paussus turcicus* (Fruivaldszky, 1835) which is distributed from SE-Europe to Kyrgyzstan (NAGEL et al. 2017b). This species is morphologically very close to *Paussus tibialis* and possibly they are sister species. Further relations of Nepalese species might exist within the species-rich genus *Platyrhopalus*. Several species of this genus extend far beyond the subtropical areas of southern, south-central and eastern China up to the Beijing and Liaoning areas, with dry and cold winters. A revision of this genus is needed, and hence we do not yet know possible of the relationships of the species occurring in Nepal with these extra-tropical species.

The highest altitudes from where Paussinae were collected in the Himalayas are approximately 2000m to 2200m in Kashmir, Uttarakhand and Nepal (cf. also MANI & SANTOKH SINGH 1957). These altitudes are reached by *Platyrhopalus paussoides* (and certainly also other congeneric species), and a few *Paussus* species (documented for *Paussus cardoni* Wasmann, 1904, *Paussus hardwickii* Hope, 1831, *Paussus nauceras* Benson, 1846, *Paussus pilicornis* (Donovan, 1804), *Paussus ploioiphorus* Benson, 1846). These relatively low altitudes are surprising when compared with the presence of a Mediterranean species up to 2500m in Morocco or several Paussini even above 3000 m in the East African Highlands in Ethiopia (NAGEL 1987).

There are more species reported from areas adjacent to Nepal or from the lower parts of the Himalaya which possibly also occur in Nepal (NAGEL et al. 2017b). Such candidates are *Anentmetus pluto* Andrewes, 1924, further species of *Eustra* and *Dhanya*, *Platyrhopalopsis pictetii* (Westwood, 1874), *Platyrhopalides badgleyi* (Fowler, 1912), *Platyrhopalus intermedius* Benson, 1846, *Platyrhopalus westwoodii* Saunders, 1838, further species of *Ceratoderus* and *Melanospilus*, *Paussus boysii* Westwood, 1845, *P. denticulatus* Westwood, 1845, *P. fichtelii* (Donovan, 1804), *P. hearseyanus* Westwood, 1842, *P. jerdani* Westwood, 1847, *P. nauceras* Benson, 1846, *P. pilicornis* (Donovan, 1804), *P. ploioiphorus* Benson, 1846, *P. politus* Westwood, 1850, *P. rufitarsis* Westwood, 1833, *P. saundersii* Westwood, 1841, *P. sesquisulcatus* Wasmann, 1899, *P. stevensianus* Westwood, 1842, *P. soleatus* Wasmann, 1894, *P. suavis* Wasmann, 1894, *P. thoracicus* (Donovan, 1804), *P. wroughtoni* Wasmann, 1894, i.e. at least 25 species.

Hence, the currently known sixteen species from Nepal represent only approximately one third of the fauna of Paussinae which probably occurs in this country. The paussine fauna of the Indomalayan Region is not at all fully known, and new species can also be expected to be discovered in Nepal. Given the predominantly pantropical distribution of Paussinae, it is not surprising that all Nepalese species are Indomalayan faunal elements. Among the species with more than one known locality, *Paussus hardwickii* Hope and *Paussus tibialis* Westwood possibly represent endemics of the Himalayan subregion of the Indomalayan region.

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